

Exhibit F



Quick Facts

The Pork Industry
at a Glance



pork
checkoff®



Welcome...

Thank you for your interest in learning more about the dynamic U.S. Pork Industry through *Quick Facts*, a Pork Checkoff publication. As you'll see in the following pages, the story of pork production in America offers a unique and fascinating look at how modern livestock production has evolved. While the economies of scale are unlike those of past decades, the commitment of today's pork producers remains unchanged – to provide their communities and the world with safe, wholesome and sustainable sources of high-quality pork.

For 25 years, the Pork Checkoff has worked successfully to advance the pork industry through promotion, research and consumer information programs. Through these efforts, U.S. pork producers continue to lead agriculture in the adoption of new technologies and have achieved record-high productivity. For example, output per breeding animal has more than doubled in the past 30 years, while the U.S. breeding herd has been reduced by more than 50 percent. This tremendous improvement in productivity has translated into a continued good value to consumers who purchase pork.

Despite the ongoing pursuit of efficiency by today's pork producers, the industry continues to face substantial challenges in the complex, global food system. Regardless of these pressures, however, producers of all sizes and types of operations continue their dedication to creating a high-quality ideal protein source that's produced in an environmentally friendly and humane manner. The industry's We Care initiative underscores this enduring commitment.

For more information, visit the Pork Checkoff's website at pork.org or call the Pork Checkoff Service Center at (800) 456-7675.

Cordially,



Chris Novak
National Pork Board CEO

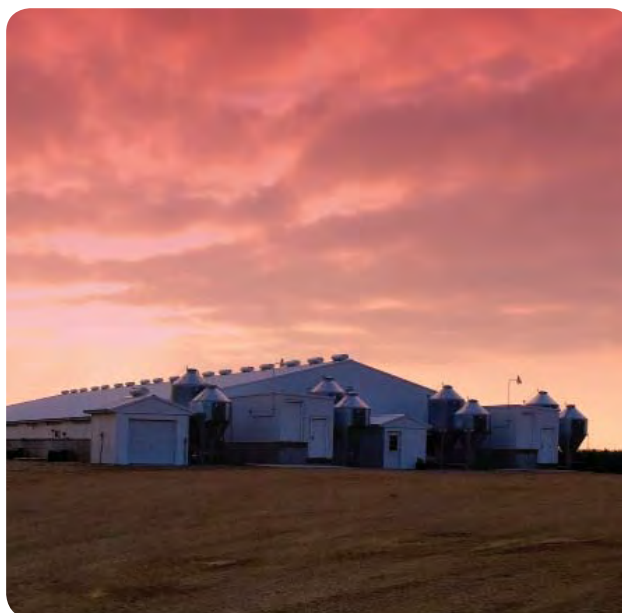
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Pork Checkoff



History

The National Pork Board, which provides the producer leadership for the Pork Checkoff, is the descendent of a long line of U.S. pork associations. The associations were formed by pork producers who faced profitability challenges and knew that they could best address these common issues by working together and jointly finding sources of funding.

The organization traces its roots to the mid-1950s when a group of producers, concerned about the future growth and profitability of the pork industry, organized the National Swine Growers Council (NSGC). In 1965, this group evolved into the National Pork Producers Council (NPPC), as it took the first steps toward creating the meat-type pig needed to produce pork products consumers desired.

“Moline 90”

In May 1966, about 90 pork producers from Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Carolina, South Dakota, Tennessee and Wisconsin met in Moline, Ill. This group, which came to be known as the “Moline 90”, gathered to establish a voluntary checkoff.

The group agreed to hire the first full-time executive secretary for the council and to raise, through contributions, a “Get Ready Fund” of \$40,000. A bank note was passed around and eight pork producers signed it, obligating each of them to pay if the “Get Ready Fund” was not raised. The note was never needed.

With some funds and staff, NPPC began moving toward development of the meat-type hog that more health-conscious consumers were beginning to demand. Realizing that promotion would create more pork sales, producer leaders sought U.S. Congressional action that would permit a market deduction to fund product promotion. They succeeded in getting amendments to the Packers and



Stockyards Act that opened the way for a voluntary checkoff system. Reflecting the forward-thinking of producers back then, as well as today, this represented the first voluntary checkoff program.

“Nickels for Profits”

In 1967, after months of organizing at the county and state levels, NPPC started the voluntary “Nickels for Profit” checkoff in six counties in Iowa and Illinois. The first check received was for \$4.90. By 1968, producer enthusiasm had spread, with 16 states organized and the nickel checkoff program launched nationwide.

By 1970, NPPC membership rose to 40,000 producers with a \$1 million operating budget. In response to members’ increasing needs for promotion and research, the checkoff increased over the years from a nickel, to a dime, to 20 cents, then to 0.3 percent of each hog’s market value.

Pork Promotion, Research and Consumer Information Act of 1985

The need for additional funds to keep pork competitive with other meat and poultry helped producers make the decision to move from a voluntary to a legislative checkoff. A “100 percent Producer Task Force” organized an effort that led to the successful passage of federal legislation – The Pork Promotion, Research and Consumer Information Act of 1985, more commonly referred to as the Pork Act, as part of the 1985 Farm Bill.

After being overwhelmingly approved by a producer referendum, the national legislative Pork Checkoff was set in motion under the supervision of the U.S. Department of Agriculture (USDA) Agriculture Marketing Service. The Checkoff is designed to provide funds for pork promotion, research and consumer information to enhance pork producers’ opportunity for success.

Under the terms of the Pork Act, all pork producers and importers of pigs and pork products contribute a portion of all sales. The current checkoff rate is 0.4 percent of value (i.e., 40 cents for every \$100 market value). The Pork Act created the National Pork Board, which is responsible for collecting the Checkoff and administering Checkoff-funded programs that benefit producers with all sizes of operations.

The National Pork Board is made up of 15 members who are nominated by the Pork Act Delegate Body and appointed by the secretary of agriculture. The board is headquartered in Des Moines, Iowa.

Since 2001, the National Pork Board has assumed responsibility for promotion, consumer education and research programs. NPPC, supported by producer membership, has responsibility for public policy affecting pork producers.

Promotion, Consumer Information and Research

The Pork Act stipulates that Checkoff funds must be used for promotion, research and consumer information programs. These programs are designed

to strengthen the position of the pork industry in the marketplace, and to maintain, develop and expand markets for pork and pork products. Checkoff funds cannot be used for influencing government or for lobbying efforts.

The Pork Checkoff funds programs in the following areas:

- **Promotion** – Centered on *Pork. The Other White Meat®*, one of the best-known advertising lines in history, the Pork Checkoff’s primary function is to promote pork in the United States and abroad.
- **Consumer information** – Teaching consumers about the characteristics, versatility, and uses of today’s pork products and making them aware of the role that pork plays in a balanced healthy diet is an important part of the board’s promotion activities.
- **Research** – Unique among commodity programs, the Pork Act enables the Pork Checkoff to conduct research on a wide variety of topics, ranging from production methods to product development to environmental solutions. Pork Checkoff education programs complete this activity by making research results available to producers.



Frequently Asked Questions

What is the National Pork Board and how are its members appointed?

Through a legislative national Pork Checkoff, pork producers invest \$0.40 for each \$100 value of hogs sold. The 15-member National Pork Board collects Checkoff funds and implements research, promotion and consumer information programs, such as advertising, retail marketing, export promotion, production improvement, and environmental management.

At Pork Forum, the industry's annual business meeting, delegates from all the state associations nominate new members of the National Pork Board. The list is then given to the U.S. Secretary of Agriculture, who selects the final board members. The board members are featured on the Checkoff's Web site at pork.org.

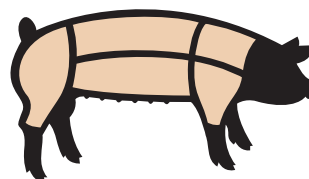
Do you have a Web site?

Yes, two. At pork.org you'll find information about pork production, along with updates on Pork Checkoff research and education. For pork recipes, consumer information and more, visit TheOtherWhiteMeat.com.



Where can I get a meat cut poster?

Meat-cut charts and posters are available for purchase by calling (800) 456-PORK (7675). Or you can download them online at the Pork Store at pork.org.



Where can I purchase pig parts (ears, feet, intestines, tails or other non-meat)?

Contact one of the following associations for assistance: American Association of Meat Processors, www.aamp.com; North American Meat Processors Association, www.namp.com; or the American Meat Institute at www.meatami.com.

How do I convert a carcass price to a live price?

Multiply the carcass price by 0.74 to convert the carcass price to the live price. To convert the live price to the carcass price, divide by 0.74.



Do you collect Checkoff on the Canadian hogs that come into the United States?

Just as all U.S. pork producers pay the Pork Checkoff, so do importers. The same assessment of \$0.40 per \$100 of value is paid when pigs are sold and when pigs or pork products are brought into the United States.

What steps are producers taking to improve animal well-being?

The Checkoff's Pork Quality Assurance® Plus (PQA Plus®) program incorporates 10 Good Production Practices so producers can measure, track and continuously improve animal well-being and focus on food safety. Also, the Youth PQA Plus provides an education program to increase animal well-being awareness among pork producers ages 8 to 18.

Who can certify producers in PQA Plus?

Advisors can include veterinarians, university Extension specialists and ag educators with a B.S. or equivalent in animal science or a related field; two years of recent, documentable swine production experience and PQA Plus advisor training taken from a PQA Plus trainer.

How do I go about having a PQA Plus site assessment performed?

After receiving PQA Plus certification, producers may obtain PQA Plus site status for a production site by having an assessment of animal well-being practices at that production site. Producers can request that a PQA Plus Advisor perform the on-site assessment. Or, producers can self-assess their site after receiving

training and endorsement to do so from a PQA Plus Advisor. For more information, log onto Pork.org.



How often do I need to recertify?

A PQA Plus producer certification and PQA Plus site status are valid for three years.

What is the Transport Quality Assurance™ (TQA) program?



TQA helps swine transporters, producers and handlers learn how to handle, move and transport pigs properly, as well as understand the potential impacts of those actions on pig well-being

and pork quality. Two types of individuals can be certified through the program. A handler receives TQA certification to move, handle and transport pigs. An advisor is trained by the Pork Checkoff and can offer certification training and administer exams to handlers.

Does the Pork Checkoff offer educational materials for producers?

Factsheets, brochures, DVDs and research data on a wide range of topics are available at pork.org or by calling (800)-456-PORK (7675).

What about pork's carbon footprint?

A recent greenhouse gas (GHG) emission report from the U.S. Environmental Protection Agency shows that the livestock industry only generates 2.4 percent of the total GHG emissions in the United States. The pork industry's contribution is about one third of 1 percent of the total, thanks in part to improved management of swine diets and proper manure management.



How have pork and hog prices changed over time?

Pork prices are cyclical and depend on many supply and demand factors, both at home and abroad. Looking back 40 years, hog prices rose in the 1970s, as did the prices of many other agricultural products. Hog prices stabilized in the 1980s and trended downward into the 1990s, due to new technologies and production efficiencies.



By 2004, both pork and hog prices rose again, with pork prices reaching record levels and hog prices nearly matching record levels. By the fourth quarter of 2007, however, producers began to experience economic losses, and a downturn in the global economy in 2008, combined with the outbreak of the H1N1 flu virus in 2009, created a perfect storm for the pork industry.

As prices declined, producers began taking steps to reduce the supply, which is one of the few steps producers of commodities can take to raise prices.

What's the role of the National Pork Board and the National Pork Producers Council?

The National Pork Board, which represents all producers by law, collects Pork Checkoff funds and uses those funds for education, promotion, research and communication. The National Pork Producers Council collects voluntary funds and uses them to manage industry and legislative issues affecting the pork industry and its members.



Where can I find the delicious pork burgers/ pork chops, etc., that I had at my local state fair?

Contact your state pork association (see the Names and Numbers section on pork.org) or the group that had the fair booth.



Does today's pork fit into a healthy diet?

As a good source of protein and nutrients, lean pork plays a key role in eating right. You can find the latest nutritional information, plenty of pork recipes, cooking tips and more at TheOtherWhiteMeat.com.



What is the current U.S. daily slaughter capacity for pigs?

It is currently about 444,925 head, up from 428,335 in 2007 and 407,875 in 2004.

Does the USDA buy any pork for our school lunch programs?

Yes. For 2009/2010, USDA bought 100 million pounds, valued at \$165 million, for food assistance programs, including food aid, school lunch and breakfast. Also, the Pork Checkoff develops nutritionally balanced pork recipes, from *Pork Taco Pasta with Chipotle Cream* to *Asian Pepper Pot with Ham*, for school lunch programs.



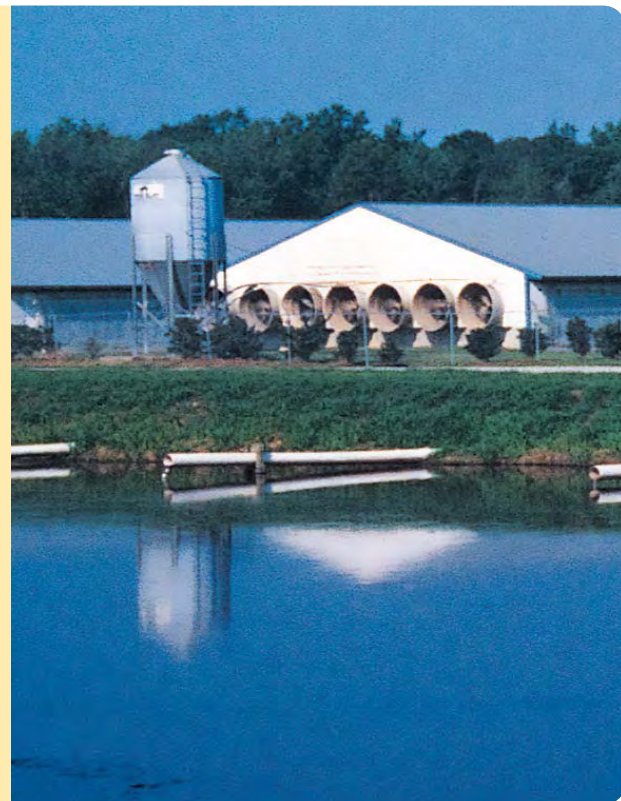
What is the market price for hogs today?

Current information on pork economics and marketing can be found at Pork.org.

Why are there fewer hog operations?

Due to advances in technology and transportation, the proportion of the world's population required to produce our food has decreased dramatically through the years. The decline has been even faster and more pronounced since the advent of the tractor.

The same pattern has applied to all U.S. agricultural sectors. Economies of size and technology have allowed fewer people to care for more hogs at a lower average cost. Every pork producer group, whether small, mid-sized or large, contains some operations with low costs, average costs and high costs. Farms with cost advantages can make adequate profits at prices that may not provide sufficient profits to higher-cost producers. As the higher-cost farms exit the industry, their market share is captured by existing producers or newcomers to the industry. The net effect is for fewer, larger pork farms.



Did You Know?

Where did Wall Street get its name?

Free-roaming hogs were notorious for rampaging through the precious grain fields of colonial New York City farmers. The Manhattan Island residents chose to limit the forays of these riotous hogs by erecting a long, permanent wall on the northern edge of what is now Lower Manhattan. A street came to border this wall, aptly enough named Wall Street.



How did “Uncle Sam” come to represent the U.S. Government?

During the War of 1812, a New York pork packer named Uncle Sam Wilson shipped a boatload of several hundred

barrels of pork to U.S. troops. Because each barrel was stamped “U.S.” on the docks, it quickly became bantered about that the “U.S.” stood for “Uncle Sam,” whose large pork shipment looked to be enough to feed the entire army. Thus did “Uncle Sam” come to represent the U.S. Government itself.

What was a key staple food for Washington’s troops at Valley Forge?

Salt pork from New Jersey was shipped behind British lines to Valley Forge to feed the hungry Continental Army in the winter of 1776-77.



What’s the origin of the word. “barbecue”?

“Barbecue” originated with French-speaking pirates, who called their Caribbean pork feast “de barbe et queue.” Translated, it means “from beard to tail,” reflecting the fact that the hog was an eminently versatile animal that could be consumed from head to toe. Today, barbecue translates into delicious pork on the grill.

Where did the saying “living high on the hog” come from?

The saying originated among army enlisted men, who received shoulder and leg cuts while officers received the top loin cuts.

Fact or Hogwash?

When hot dogs were first sold, street vendors called them “red hots,” and they didn’t come on a bun. Instead, a pair of white cotton gloves came with each one to keep fingers cool while eating.



Fact.

People at the 1904 St. Louis World’s Fair enjoyed “red hots.” Along with hot dogs, ice cream cones also were introduced there to the public for the first time.

What’s the origin of the saying “a pig in a poke?”

This common saying references a common trick played by unscrupulous merchants in 17th century England. They tried to pawn off a cat on an unsuspecting “greenhorn” as a suckling pig. When he opened the poke (sack), he “let the cat out of the bag,” and the trick was disclosed.

Did you know that...

The word, “earmark,” which we now use to mean ‘to designate’ or ‘to set aside for a particular purpose’, actually has a very simple origin. For centuries, farmers marked their livestock with distinctive notches in the animals’ ears. Earmark in the literal sense first appeared in English around 1591, but the use of earmark in the figurative sense ‘to designate’ arose only in the late 19th century.



Did you know that...

Women who cut calories but included more protein, including six ounces of lean pork per day, kept more muscle mass while losing weight than women who consumed the same amount of calories but less protein. Consuming a higher-protein diet also helped retain a sense of satiety or fullness after meals, according to the Checkoff-funded project conducted by Purdue University.



DID you know?

TheOtherWhiteMeat.com offers over 1,700 pork recipes to consumers, along with information on all things pork.



What's the top price ever paid for a hog?

The highest known price paid for a hog was \$220,000 at the 2001 Summer Type Conference. The pig, bred by Todd Creager of Ohio, sold to Lifeline Genetics of Oklahoma.



What did President Harry Truman have to say about hogs?

“No man should be allowed to be president who does not understand hogs.”

Fact: Pork can be part of a restricted-fat, low-cholesterol diet.

Yes! Today, ounce for ounce, pork tenderloin is as lean as a skinless chicken breast. Six of the most common pork cuts have, on average, 16 percent less fat and 27 percent less saturated fat than 19 years ago. Pork also is an excellent source of protein, thiamin, vitamin B6, phosphorus and niacin, and a good source of potassium, riboflavin and zinc. For more nutrition info, go to TheOtherWhiteMeat.com.



Fact or hogwash?

Pork tenderloin is just as lean as a skinless chicken breast.

Fact.

Research shows that ounce for ounce, pork tenderloin is lean as a skinless chicken breast. A 3-ounce serving of pork tenderloin has only 2.98 grams of total fat and 1.02 grams of saturated fat.



Did you know that...

Pork is the world's most widely eaten meat.

What's the origin of the saying "pork barrel politics"?



The phrase is derived from the pre-Civil War practice of distributing salt pork to the slaves from huge barrels. By the 1870s, congressmen were referred to as regularly dipping into the "pork barrel" to obtain funds for popular projects in their home districts.

Fact or Hogwash?

The longest single sausage was over a mile long.

Fact.

A single sausage measuring 5,917 feet in length was cooked in Barcelona, Spain, on September 22, 1986.



Did you know that...

As popular as pork is in America, it is not the United States, but China, that is the world's No. 1 producer and consumer of fresh pork.



Did you know that...

In ancient China, fresh pork enjoyed royal status. Around 4000 B.C., the Chinese people were ordered to raise and breed hogs by a royal decree from the emperor of China.

Did you know that...

The ancient Chinese so hated to be separated from fresh pork that the departed sometimes were accompanied to the grave with their hogs.

What's the origin of the saying to "go whole hog"?

The expression came from the 18th century, when the English shilling was at one time called a "hog." Thus, a spendthrift, one willing to spend an entire shilling on the entertainment of a friend in a pub, was willing to "go whole hog."

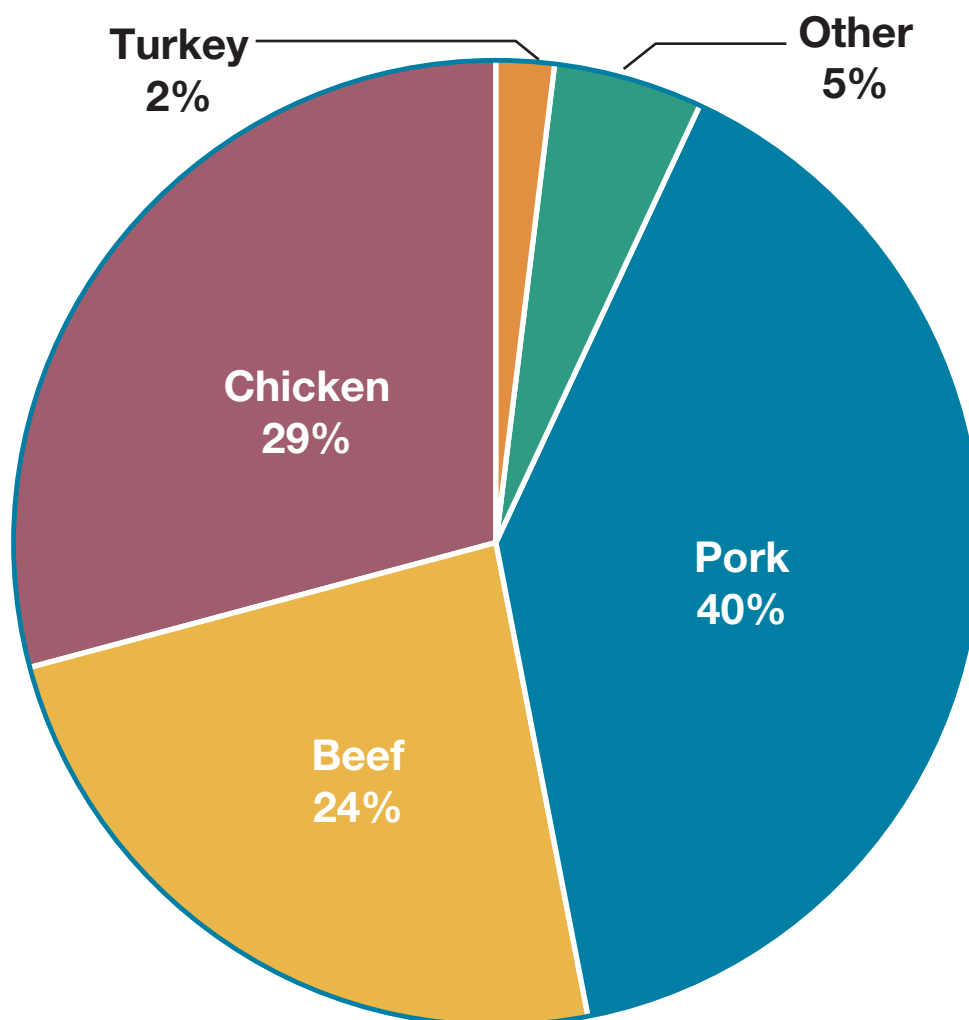
What's the heaviest hog ever?

A Poland China hog named "Big Bill" weighed 2,552 pounds and measured 9 feet long. The owner of this hefty hog was Burford Butler of Jackson, Tennessee, in 1933. In contrast, the average market weight of today's lean hogs is around 265 pounds.



Pork Facts

Pork Is the World's Most Widely Eaten Meat



Source: USDA Foreign Agricultural Service, 2008

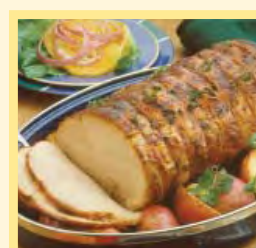
How Many Meals Come from One Pig?



Each market hog
represents...

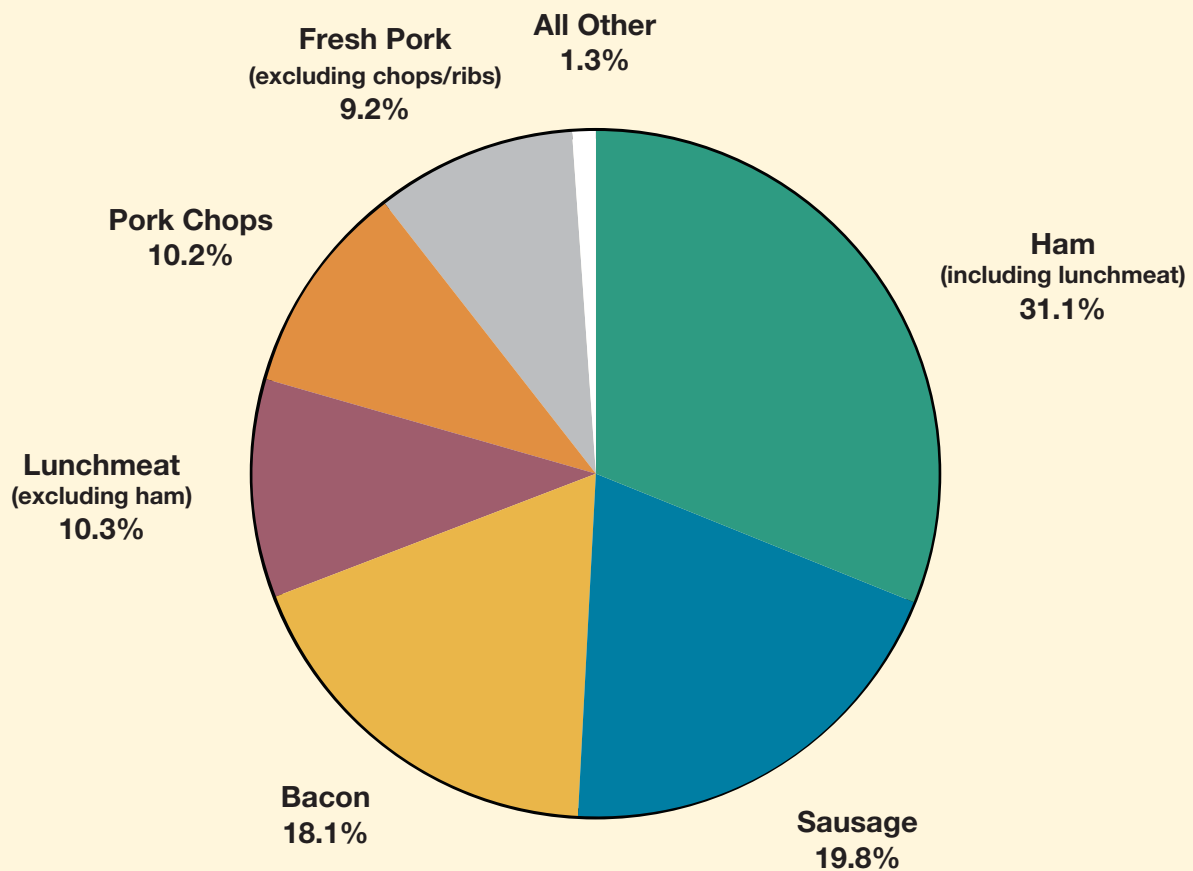
371 servings of pork

Source: Locke Karriker, DVM, associate professor of veterinary diagnostic and production animal medicine at Iowa State University. Based on a 265-pound market weight, 70 percent yield and 8-ounce servings.



U.S. In-Home Pork Consumption by Type

Percent of Eatings

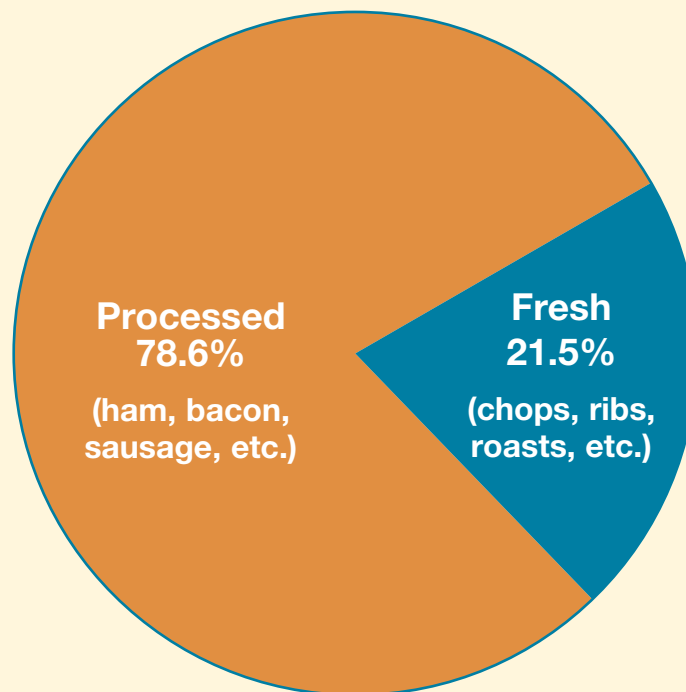


Source: The NPD Group/National Eating Trends – year ending November 2009

Fresh vs. Processed Pork Consumption

Percent In-Home Pork Eatings

The majority of pork eatings involve processed pork, with fresh pork accounting for 21.5 percent of eatings.

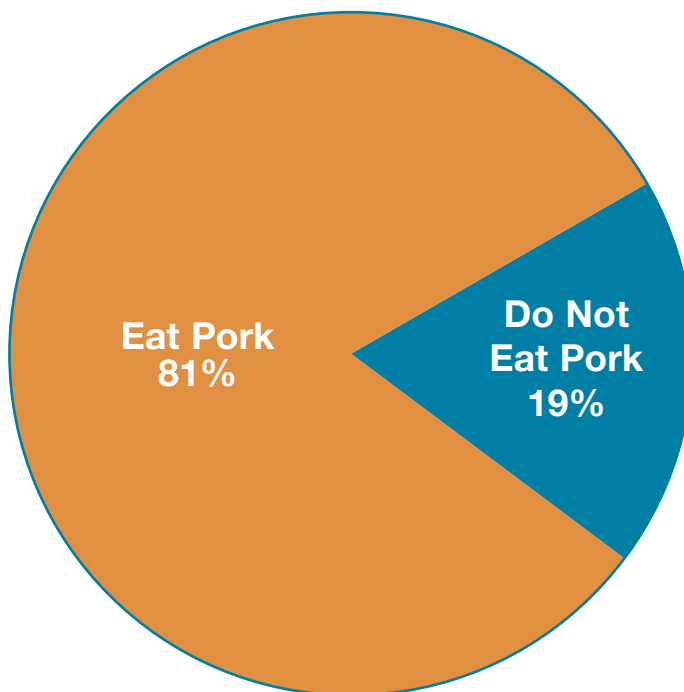


Source: The NPD Group/National Eating Trends – year ending November 2009

In-Home Total Pork Consumption*

Percent Consuming Pork In-Home at Least Once in an Average Two Weeks

Some 81 percent of the population consumes pork at least once in a two-week period. These users enjoy more than two eatings a week.

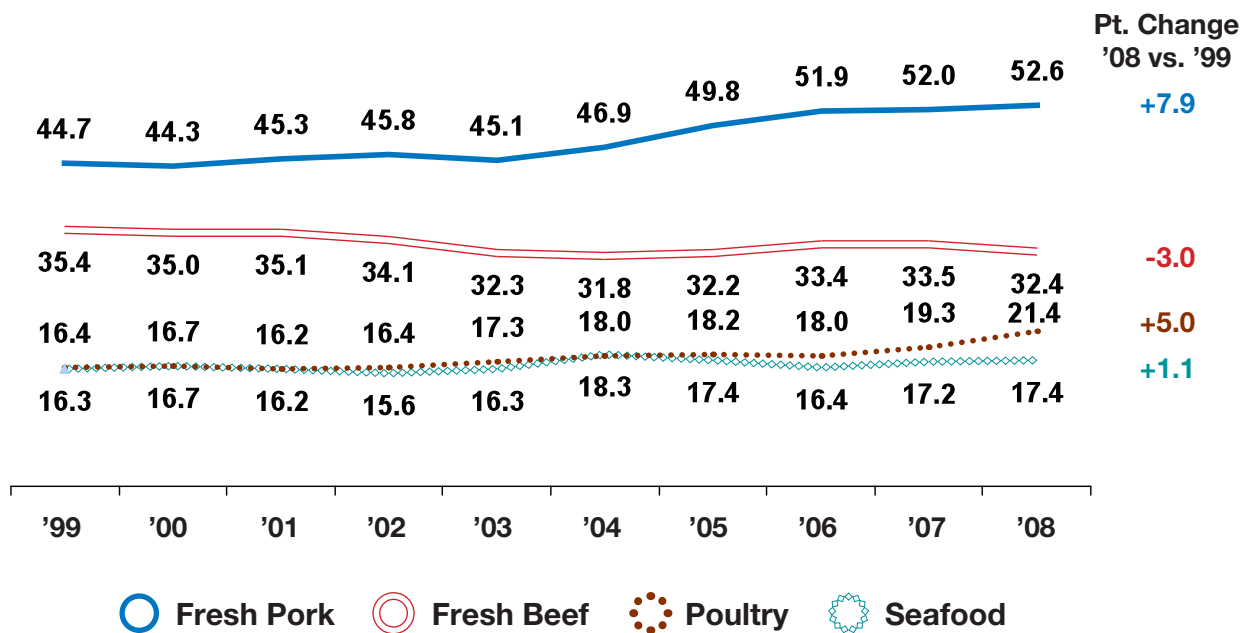


*Consumed in-home/carried.

Source: NPD's National Eating Trends (NET) Service, two years ending August 2009

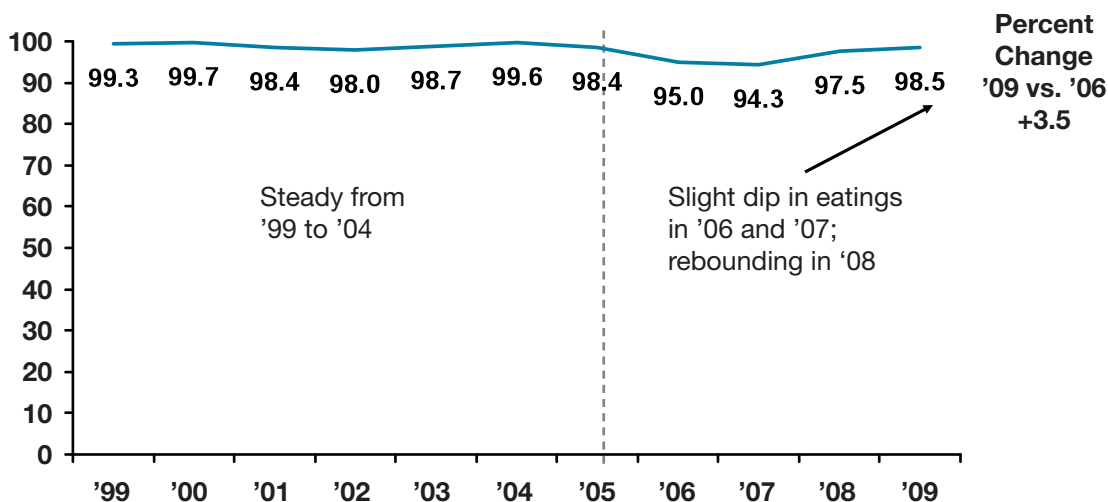
Pork No. 1 in In-Home Protein Eatings

Total In-Home Consumption* (Annual Eatings Per Capita)



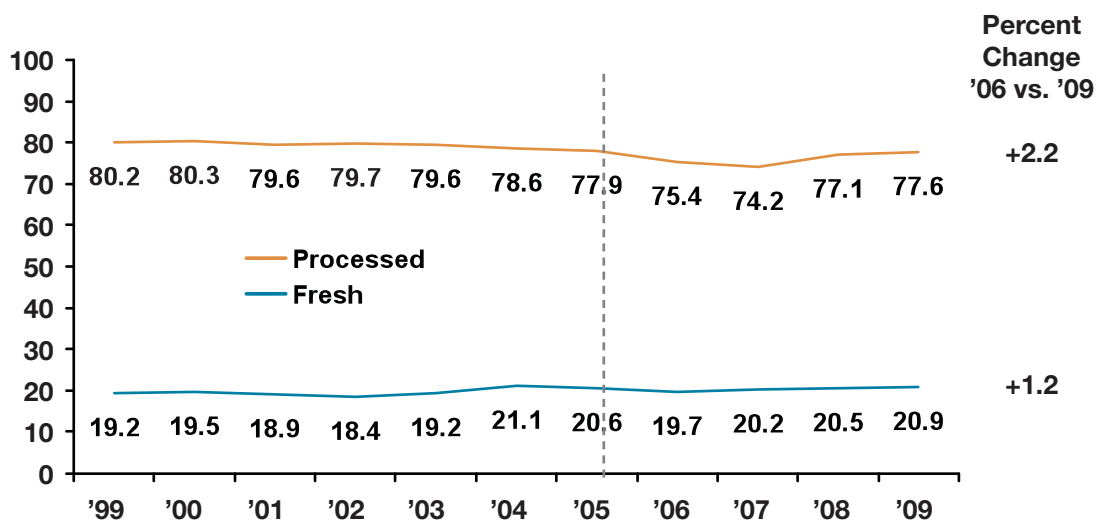
Source: NPD's National Eating Trends (NET) Service, two years rolling August

Annual In-Home Pork Eatings Per Capita



Fresh vs. Processed In-Home Pork Consumption

Annual Eatings Per Capita



Processed pork does not include hot dogs.

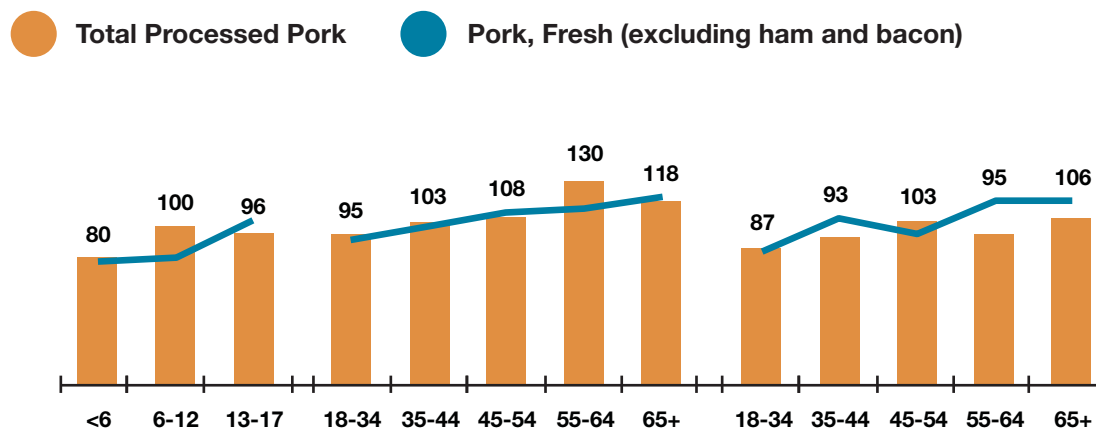
Consumed in-home/carried.

Source: NPD's National Eating Trends (NET) Service, two years ending August 2009

Pork Consumption by Age and Gender

Total Processed Pork vs Pork, Fresh (excluding ham and bacon)

Percent of Eatings Indexed to Sample 2008/2009

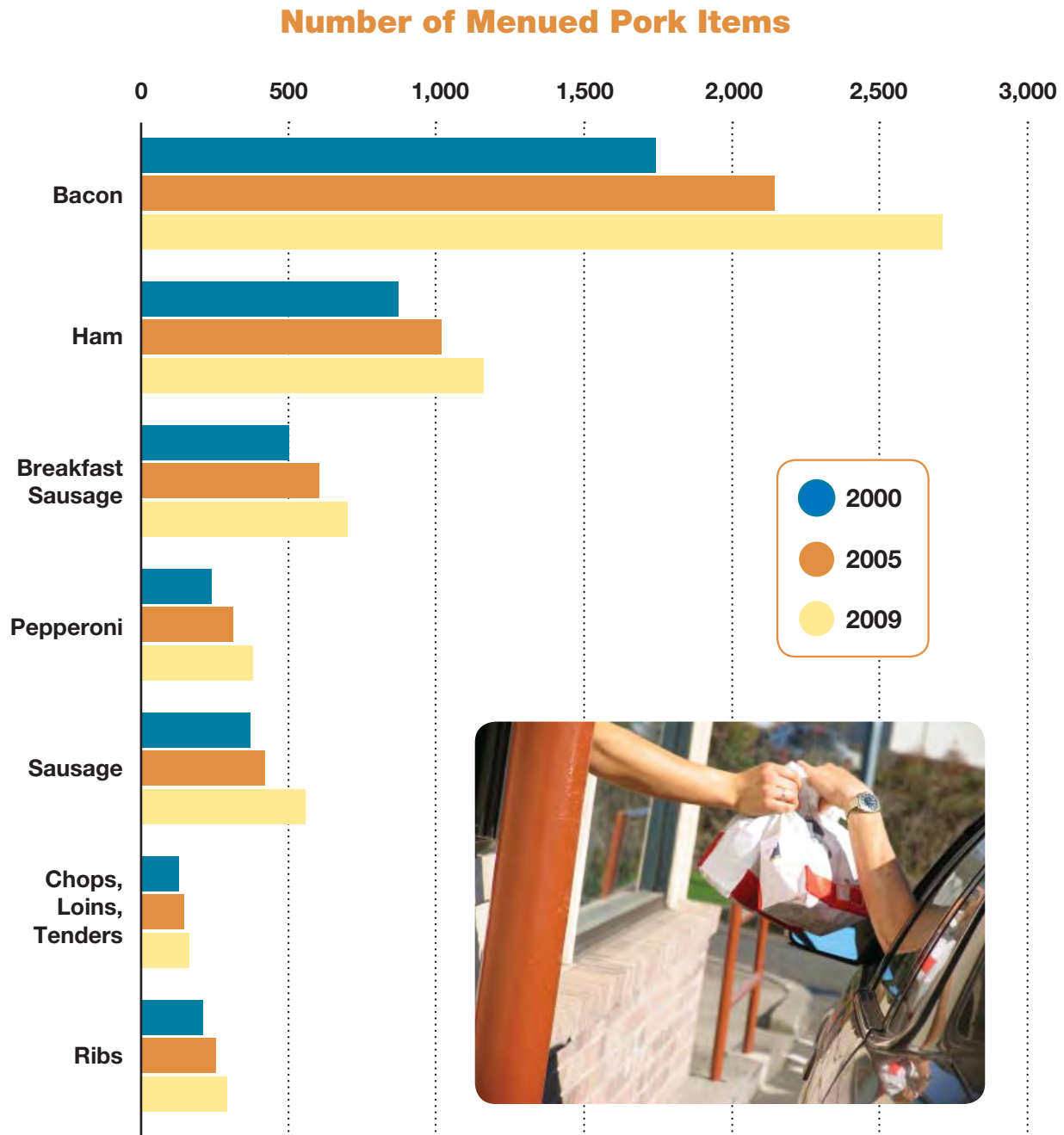


	Children			Males					Females				
% of Sample	8.0	9.6	6.4	8.4	6.9	7.6	6.2	5.7	10.7	8.3	8.3	6.7	7.1
Total Processed Pork													
% of Eatings	6.4	9.6	6.2	8.0	7.1	8.2	8.1	6.8	9.3	7.7	8.5	6.3	7.5
Pork, Fresh (Excluding Ham + Bacon)													
% of Eatings	6.3	7.9	6.8	7.8	7.0	8.4	7.0	6.9	9.1	8.8	8.0	7.8	8.3

Note: Index of 120+ = greater than average; Index of 80 or less = less than average

Source: NPD's National Eating Trends (NET) Service, two years rolling August

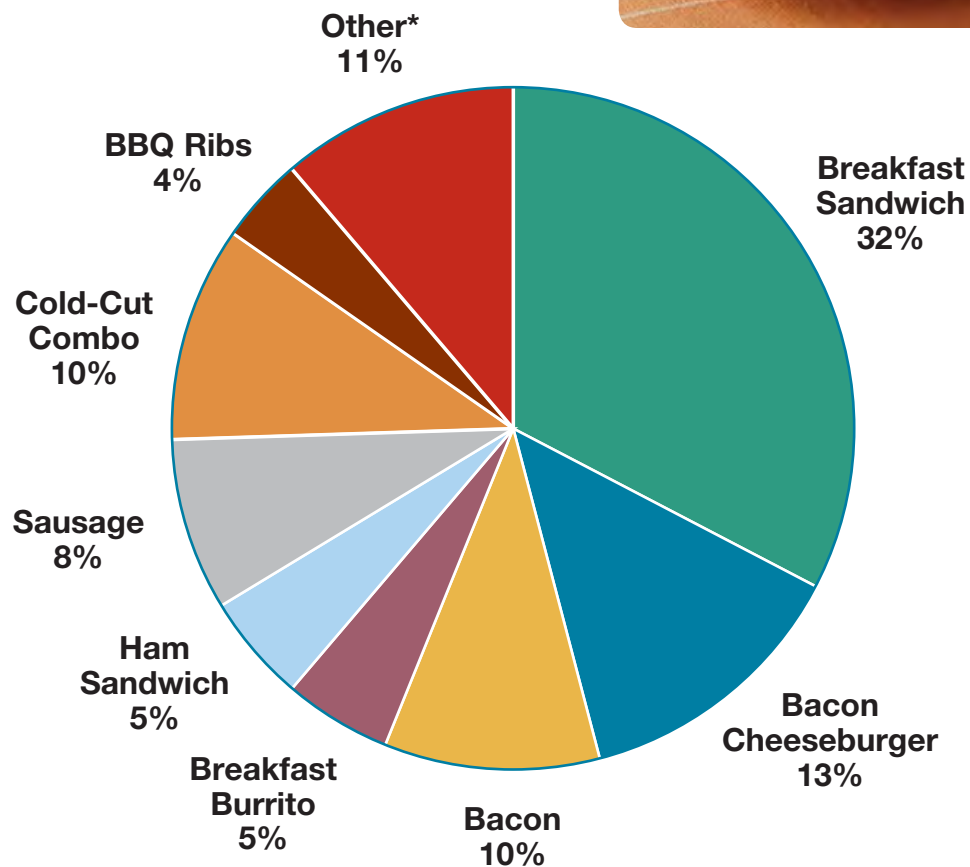
Growth in Number of Menued Pork Items



Source: MenuMine 2009, analyses conducted on a “same-store” basis of chain and independent restaurant menus

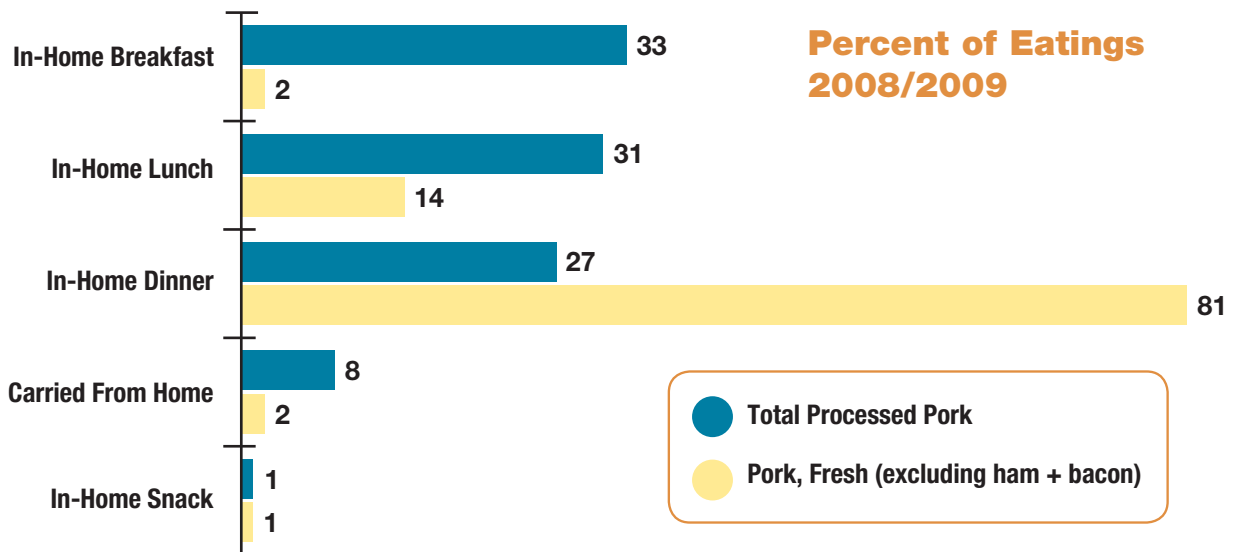
Pork Items on Restaurant Menus – 2009

Pork Consumption By Type Percent of Eatings



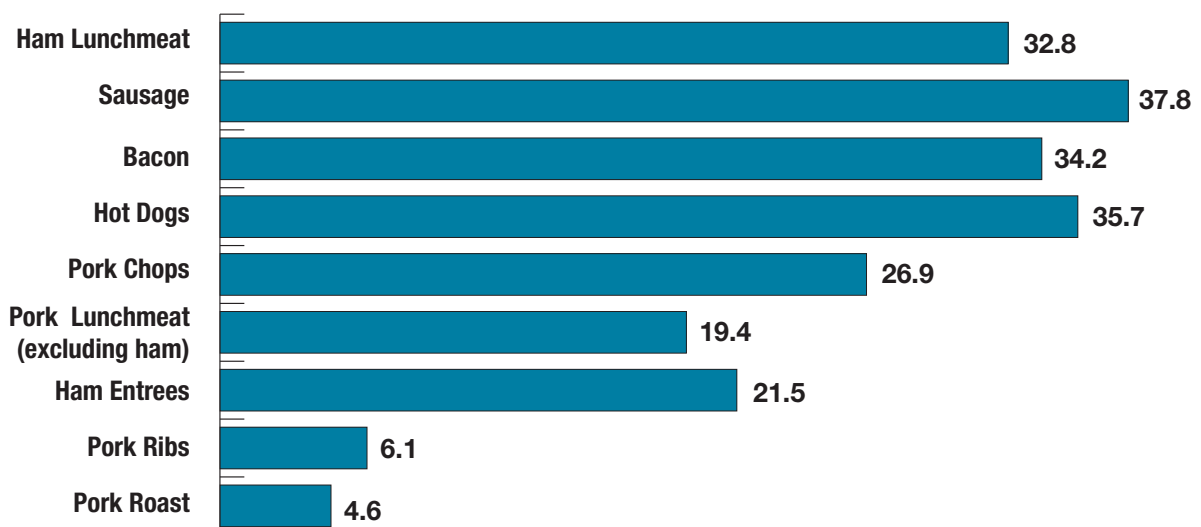
Source: NPD Group CREST

Pork Use by Meal Occasion



Ham Lunchmeat, Sausage, Bacon and Hot Dogs Are Each Consumed Regularly by Roughly One-Third of the Population

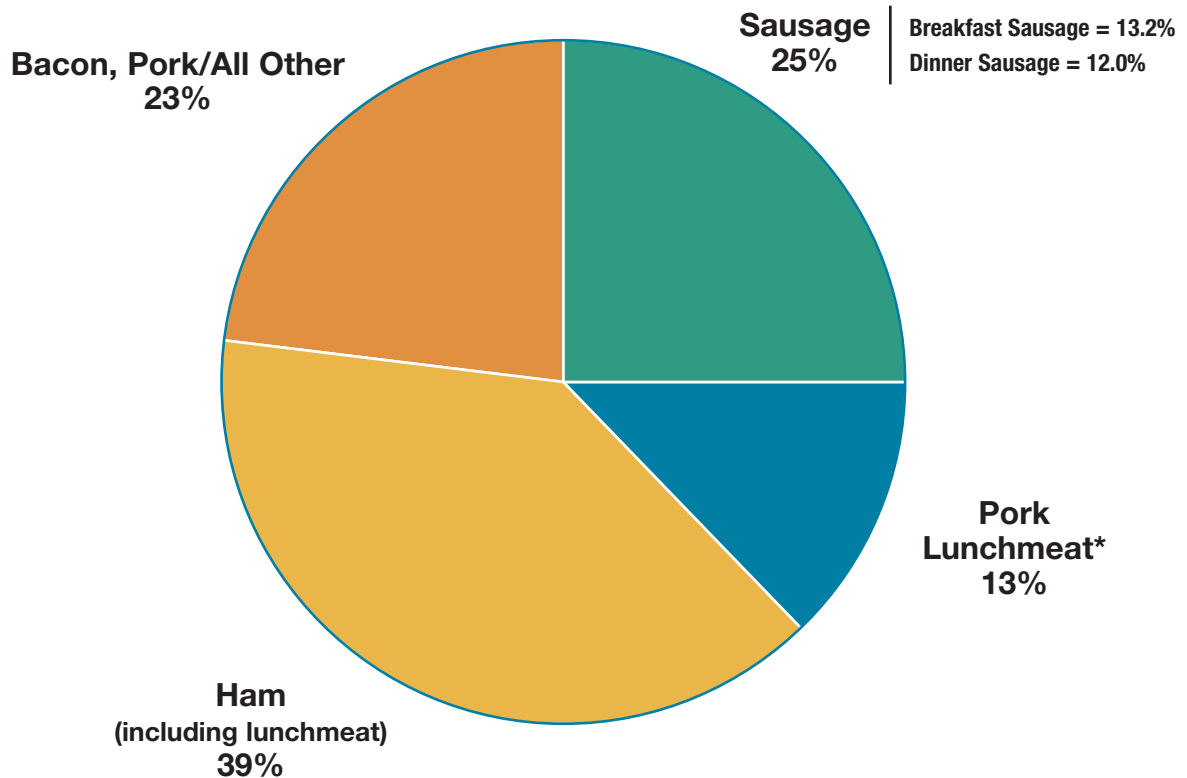
Penetration: Percent of Individuals Consuming in-Home in Two Weeks – 2009



Source: The NPD Group/National Eating Trends – year ending November 2009

Percentage of Processed Pork Eatings

Ham Makes Up Over a Third of Processed Pork Eatings



*Pork lunchmeat = bologna, salami, luncheon loaf, etc.; excludes ham
Source: The NPD Group/National Eating Trends – Year ending November 2009

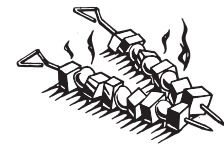
The Lowdown on Lean Cuts



DID you know?

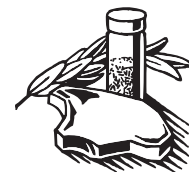
The leanest cuts of pork have the word **loin** in the name, such as pork tenderloin or loin chop. Fresh or cured ham also can be a lean choice.

Trim to Slim – Reduce calories and fat by trimming all visible fat from lean cuts before cooking. This can cut fat content per serving in half. Trimming prevents fat from being absorbed into the meat during cooking.



Cook It Light – Using low-fat cooking methods like grilling, broiling, stir-frying and pan broiling maximizes flavor while keeping added fat to a minimum.

Spice for Life – Pork comes in a variety of cuts and its versatility complements numerous flavors. Seasoning pork with herbs and spices (other than salt) is an easy way to boost flavor and cut back on fat and salt at the same time. Rub the pork with a combo of herbs and spices, such as rosemary, basil, cayenne or paprika, before grilling, broiling or roasting.



Develop an Eye for Size – Practicing portion control is just as important as buying and cooking lean. The USDA Food Guidance System recommends two or three servings from the Meat, Poultry, Fish, Dry Beans, Eggs and Nuts Group each day, or the equivalent of 5 to 6 ½ ounces of cooked lean meat for adults.



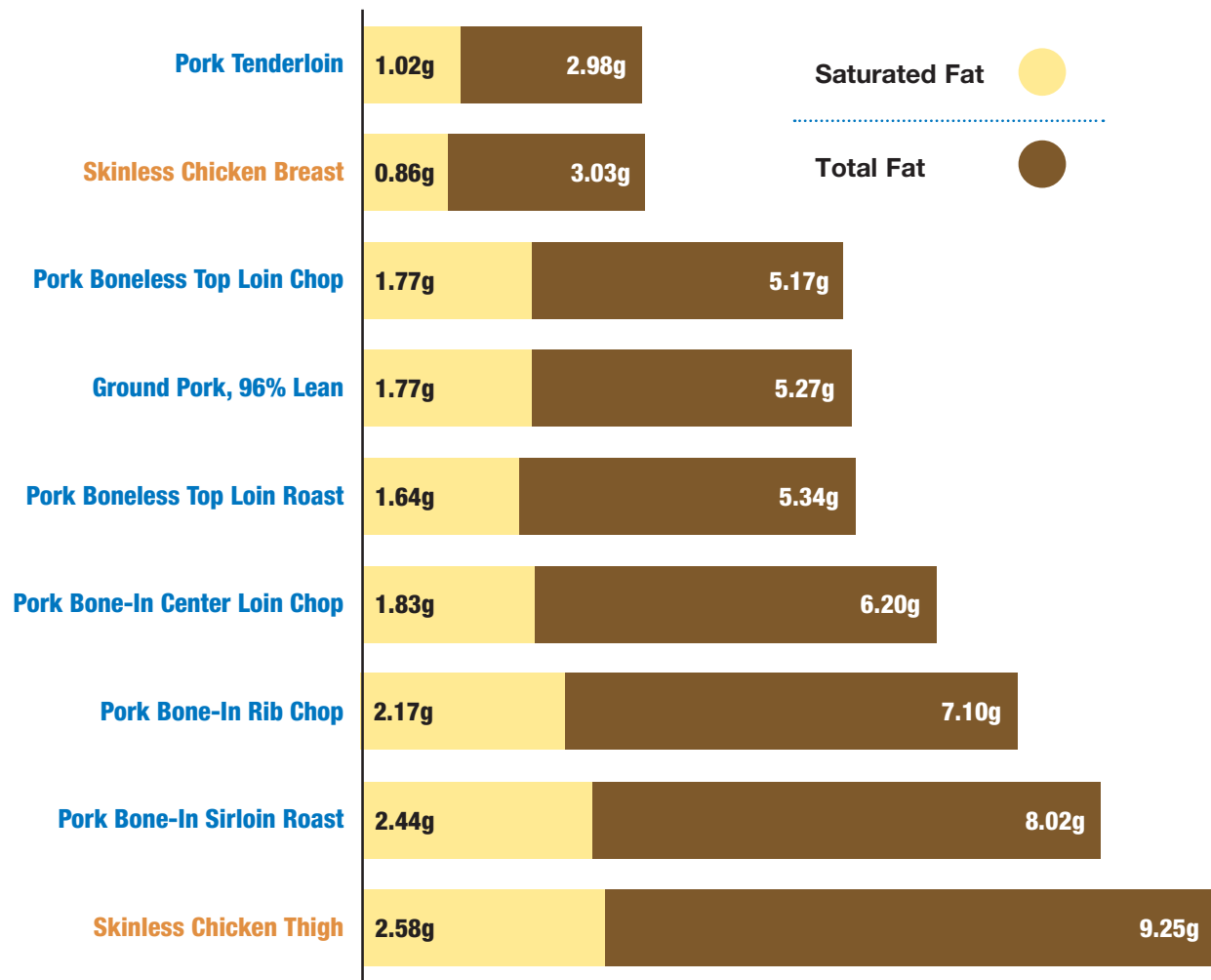
Quick Shopping Tip – Estimate about 4 ounces of boneless, trimmed raw pork to get 3 ounces of cooked pork. A 3-ounce serving of trimmed, cooked pork is about the size of a deck of cards. A ¾-inch pork chop will be about 3 ounces when cooked.



The Power of Pork For Healthy Eating

Seven common cuts of pork are, on average, 16 percent leaner than 20 years ago.

Here are seven cuts of lean pork with a total fat content that falls between a skinless chicken breast and a skinless chicken thigh.



Based on 3-ounce cooked servings (roasted or broiled), visible fat trimmed after cooking.

Reference: U.S. Department of Agriculture, Agriculture Research Service, 2009.

Lean: Less than 10 grams total fat, 4.5 grams saturated fat and 95 milligrams cholesterol per serving.

Extra Lean: Less than 5 grams total fat, 2 grams saturated fat and 95 milligrams cholesterol per serving.

Ham Still No. 1 In-home Lunch Sandwich

Top 10 Sandwiches Served In-home at Lunch

1995

1. Ham
2. Turkey
3. Cheese
4. Peanut Butter and Jelly
5. Bologna
6. Tuna
7. Hot Dog
8. Hamburger
9. Egg
10. Chicken

2009

1. Ham
2. Peanut Butter and Jelly
3. Turkey
4. Cheese
5. Hot Dog
6. Burger
7. Tuna
8. Bologna
9. Chicken
10. Egg



Sources: The NPD Groups National Eating Trends® Service

How to Carve a Ham:

1.



2.



3.



1. Place the ham on a cutting board with the shank – or lower leg – to the carver's right. Steady the ham with a fork and cut a few slices from the thin side of the leg as shown.
2. Place the ham on the side where you removed slices. Make perpendicular slices to the leg bone.
3. To loosen the slices, cut along the leg bone, removing each slice with the fork.

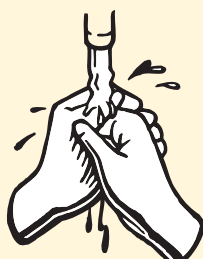
Cues for the Conscientious Cook

- Use an instant-read thermometer to determine when meat is cooked to a safe temperature. The U.S. Department of Agriculture recommends that pork be cooked to an internal temperature of 145° F, followed by a three-minute rest time (medium-rare), up to 160° F (medium). This range of cooking will result in a flavorful, tender and juicy eating experience.
- Keep hot foods hot (140° F or above) and cold foods cold (40° F or below).
- Never leave cooked meat out at room temperature for more than two hours (one hour in hot weather 90° F or above).
- Serve cooked food on a clean plate and use clean utensils. Use separate serving plates and utensils for raw and cooked meats.



A Plan for Preparation

- Wash hands, all utensils, containers, cutting boards and work surfaces with warm soapy water for 20 seconds (count to 30) before and after handling meat or other food.
- Thaw meat in the refrigerator or microwave, not at room temperature.
- Do not wash raw meat before cooking.
- Cook meat immediately after thawing, especially if thawed by microwaving.
- Cut meat, poultry and fish on a separate cutting board from the one you use for fresh foods like vegetables, or thoroughly clean the cutting board between uses.



Pork Fits into a Healthy Diet

Leaner than ever – USDA research reveals that six of the most common cuts of pork are 16 percent leaner and contain 27 percent less saturated fat than they did 19 years ago. As a lean protein option, pork can be part of heart-healthy diet.

Protein power – Women who cut calories but included more protein, including six ounces of lean pork per day, kept more muscle mass while losing weight than women who consumed the same amount of calories but less protein. Consuming a higher-protein diet also helped retain a sense of satiety or fullness after meals.

Nutrient rich – One serving of pork tenderloin contains many vitamins and minerals. It's an excellent source of many B-vitamins and a good source of other nutrients including phosphorus, zinc and potassium. It's also naturally low in sodium – only 2 percent of the Daily Value per serving.

Pork Cooking Times and Temperatures

Method	Cut	Thickness/ Weight	Internal Temp. Followed By a Three-Minute Rest	Average Recommended Cooking Time (minutes per pound OR total minutes)
Roasting Roast at 350° F., unless otherwise noted. Roast in a shallow pan, uncovered	Loin Roast, Bone-In or Boneless*	2–5 lbs.	145°	20 minutes per lb.
	Crown Roast*	10 lbs.	145°	12 minutes per lb.
	Fresh Leg/Uncured Ham*	18-20 lbs.	145°	15 minutes per lb.
	Tenderloin* (roast at 425°F.)	½–1½ lbs.	145°	20-27 minutes total time
	Ribs	—	Tender	1½–2 hours
	Ham, fully cooked	5–6 lbs.	140°	20 minutes per lb.
Broiling 4-5 inches from heat OR Grilling over direct medium heat; turn once halfway through grilling	Loin Chops, Bone-In or Boneless	¾ inch	145°	8–9 minutes
	Thick Chop	1½ inches	145°	12–16 minutes
	Loin Kabobs	1 inch cubes	Tender	10–15 minutes
	Tenderloin	½–1½ lbs.	145°	20 minutes
	Ground Pork Patties	½-inch	160°	8–10 minutes
Barbecuing over indirect medium heat (285° F.)	Loin Roast, Bone-In or Boneless*	2–5 lbs.	145°	2 lbs. roast = 20 minutes per lb. 3½–5 lbs roast = 15 minutes per lb.
	Shoulder (Butt)*	3–6 lbs.	Tender	45 minutes per lb.
	Ribs	—	Tender	1½–2 hours
Sautéing Add a little cooking oil to pan; sauté over medium-high heat and turn once halfway through cooking time	Cutlets	¼ inch	Tender	3–4 minutes
	Loin Chops, Bone-In or Boneless	¾ inch	145°	8 minutes total
	Tenderloin Medallions	¼–½ inch	Tender	4–8 minutes total
	Ground Pork Patties	½ inch	160°	8–10 minutes total
Braising Cook, covered, with a liquid at a simmer; turn once halfway through cooking time	Loin Chops, Bone-In or Boneless	½–¾ inch	145°	6-8 minutes total
	Loin Cubes	1 inch	Tender	8–10 minutes
	Tenderloin Medallions	½–¾ inch	Tender	8–10 minutes
	Shoulder Butt*	3–6 lbs.	Tender	2–2½ hours
	Ribs	—	Tender	1½–2 hours
Stewing Cook, covered, with liquid at a slow simmer	Loin or Shoulder Cubes	1 inch	Tender	45 minutes–1 hour

Pork today is very lean and shouldn't be overcooked. To check doneness, use a digital cooking thermometer. The National Pork Board follows the guidance of the U.S. Department of Agriculture, which recommends cooking roasts, tenderloins and chops to an internal temperature of 145° F, followed by a three-minute rest time, resulting in a flavorful, tender and juicy eating experience. Ground pork, like all ground meat, should be cooked to 160° F. Pre-cooked ham can be reheated to 140° F or enjoyed cold.

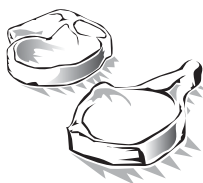
***Note:** For easier slicing and to let the pork juices redistribute throughout the meat, remove larger cuts, such as roasts, from the oven or grill and let them stand for a total of 10 minutes before serving.

Making Sense of the Meatcase

What's for supper? Whether you're in a hurry or have time to spend in the kitchen, pork offers a variety of delicious options. Use this guide to help decide what cut will make the most of your meal.

Quick meals – cuts that cook in 30 minutes or less

Chops:
Loin, rib,
sirloin, top
loin, blade



Tenderloin



Cooking Tip: Paired with your favorite veggies, cubes of boneless chops or tenderloin make great kabobs.

**Ground
Pork**



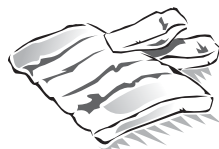
Ham Steaks



Cooking Tip: For delicious pork burgers on the grill, form ground pork into 1/2-inch thick patties and broil 4 inches from heat for about 8 minutes.

Time on your side – cuts that cook in 30 minutes or more

Ribs:
Back,
spareribs,
country-style



Roasts:
Loin, ham,
fresh leg,
shoulder



Cooking Tip: Don't boil ribs prior to grilling or roasting. They will keep their flavor and tenderness better if slow-cooked in the oven or over indirect heat on the grill.

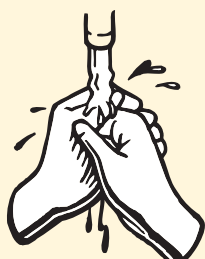
Cues for the Conscientious Cook

- Use an instant-read thermometer to determine when meat is cooked to a safe temperature. Correctly cooked pork is juicy and tender, with a slight blush of pink in the center and will be ready when it reaches an internal temperature of 160° F. For large cuts of pork, cook to 150° F and allow the roast to sit on the counter about 10 minutes before cutting. The temperature will rise to 160° F.
- Keep hot foods hot (140° F or above) and cold foods cold (40° F or below).
- Never leave cooked meat out at room temperature for more than two hours (one hour in hot weather 90° F or above).
- Serve cooked food on a clean plate and use clean utensils. Use separate serving plates and utensils for raw and cooked meats.



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Convenience Drives the Dinner Menu



75 percent of consumers decide what to prepare for an in-home dinner that **same day.**

- 38 percent of these consumers decide “right before” preparing.

Four of the top five reasons listed for serving a specific dish revolve around time and ease. Family satisfaction also is important.

- Requires little effort or easy
- Takes little/no planning
- Made with foods that are on hand
- Liked by everyone
- Easily cleaned up



Source: The NPD Group's NET Plus Dinner database

Pork Cooking Times and Temperatures

Method	Cut	Thickness/ Weight	Final Internal Temperature (Fahrenheit)	Total Cooking Time (Minutes)
Roasting Roast at 350° F., Roast in a shallow pan, uncovered	Loin Roast*, Bone-In and Boneless	2–5 lbs.	150°	20 minutes per lb.
	Crown Roast*	6–10 lbs.	150°	20 minutes per lb.
	Fresh Leg/Uncured Ham*	3½ lbs.	150°	20 minutes per lb.
	Shoulder Butt*	3–6 lbs.	160°	30 minutes per lb.
	Tenderloin* (roast at 425°F.-450°F.)	½–1½ lbs.	160°	20–30 minutes
	Ribs	—	Tender	1½–2 hours
	Ham, fully cooked	5–6 lbs.	140°	20 minutes per lb.
Broiling 4 inches from heat OR Grilling over direct heat	Loin Chops, Bone-In or Boneless	¾ inch	160°	8–10 minutes
	Thick Chop	1½ inches	160°	12–16 minutes
	Kabobs	1 inch cubes	Tender	10–15 minutes
	Tenderloin*	½–1½ lbs.	160°	15–25 minutes
	Ground Pork Patties	½-inch	160°	8–10 minutes
Barbecuing over indirect heat	Loin Roast*, Bone-In or Boneless	2–5 lbs.	160°	20 minutes per lb.
	Leg	3½ lbs.	160°	40 minutes per lb.
	Shoulder Butt	3–6 lbs.	160°	45 minutes per lb.
	Ribs	—	Tender	1½–2 hours
Sautéing Add a little fat to pan; sauté over medium-high heat	Cutlets	¼ inch	Tender	3–4 minutes
	Loin Chops, Bone-In or Boneless	¾ inch	160°	7–8 minutes
	Tenderloin Medallions	¼–½ inch	Tender	4–8 minutes
	Ground Pork Patties	½ inch	160°	8–10 minutes
Braising Cook, covered, with a liquid at a simmer	Chops or Cutlets	¼–1 inch	160°	8–15 minutes
	Cubes	1 inch	Tender	8–10 minutes
	Tenderloin Medallions	½–¾ inch	Tender	8–10 minutes
	Shoulder Butt	3–6 lbs.	Tender	2–2½ hours
	Ribs	—	Tender	1½–2 hours
Stewing Cook, covered, with liquid at a slow simmer	Ribs	—	Tender	2–2½ hours
	Cubes	1 inch	Tender	45 minutes–1 hour

Today's pork is very lean and shouldn't be overcooked. The best test of doneness is to use an instant-read meat thermometer to check the internal temperature. We recommend cooking pork chops, roasts and tenderloins to 160° F, which leaves the center pink and juicy.* Less tender cuts, like pork shoulder (butt) and ribs can be cooked long and slow, to render them tender.

* For larger cuts of pork, such as roasts, cook to 150° F; remove from the oven or grill and allow to set for 10 minutes before slicing. The temperature of the roast will continue to rise to 160°, and the pork juices will redistribute throughout the roast before slicing.

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Source: The NPD Group's NET Plus Dinner database

Everything But the Oink

The hog is serving essential human needs every-day. From the safe and high-quality product on your plate to a medical lifesaving device and everything in between no other animal provides society with a wider range of products than the hog.

Co-products from hogs play a vital though less visible role in maintaining and improving the quality of human life. Thanks to innovative research and new technologies, new and different co-products from hogs are constantly being developed.

Insulin from hogs is used in the treatment of diabetes. Hog heart valves are used to replace damaged or diseased human heart valves. Skin from hogs is used to treat severe burn victims.

The amazing utility of the hog has motivated the saying, “We use everything but the oink.”

A viable animal agriculture not only provides an abundant supply of vital nutrients found in meat, but is also a ready source of essential and useful co-products that people depend on so extensively.



DID

you know?



Hog heart valves, specially preserved and treated, are surgically implanted in humans to replace heart valves weakened by disease or injury. Since the first operation in 1971, thousands of hog heart valves have been successfully implanted in human recipients of all ages.

Everything But the Oink

Pharmaceutical Co-Products



Pharmaceuticals rank second only to meat itself in the important contributions hogs make to society. Rapidly advancing science and technology are continually adding to the list of life-supporting and lifesaving products derived from the incredible hog.

Hogs are powerful medicine: All told, hogs are a source of nearly 20 drugs and pharmaceuticals.

Adrenal Glands

Corticosteroids
Cortisone
Epinephrine
Norepinephrine

Blood

Blood Albumens
Blood Fibrin
Fetal Pig Plasma
Plasmin

Brain

Cholesterol
Hypothalamus

Gall Bladder

Chenodeoxycholic Acid

Heart

Heart Valves

Intestines

Enterogastrone
Heparin
Secretin

Liver

Cholic Acid Catalase
Desiccated Liver

Ovaries

Estrogens
Progesterone
Relaxin

Pancreas Gland

Insulin

Kallikrein

Glucagon
Lipase
Pancreatin
Trypsin
Chymotrypsin

Pineal Gland

Melatonin

Pituitary Gland

ACTH - Adrenocorticotrophic Hormone
ADH - Antidiuretic Hormone
Oxytocin
Prolactin
TSH - Thyroid Stimulating Hormone

Skin

Porcine Burn Dressings
Gelatin

Spleen

Splenic Fluid

Stomach

Pepsin
Mucin
Intrinsic Factor

Thyroid Gland

Thyroxin
Calcitonin
Thyroglobulin

Industrial Co-Products

Hogs also make a very significant contribution to the world of industrial and consumer products. Hog co-products are sources of chemicals used in the manufacture of a wide range of products that cannot be duplicated by syntheses. And, of course, pigskin is used extensively as high-quality leather for clothing, shoes, handbags, sporting goods, upholstery and more.

Blood

Sticking Agent
Leather Treating Agents
Plywood
Adhesive
Protein Source in Feeds
Fabric Printing & Dyeing

Brains

Cholesterol

Bones & Skin

Glue
Pigskin Garments
Gloves & Shoes

Dried Bones

Buttons
Bone China
Bone Meal
Mineral Source in Feed
Fertilizer
Porcelain Enamel
Glass
Water Filters

Gall Stones

Ornaments

Hair

Artist's Brushes
Insulation
Upholstery

Meat Scraps

Commercial Feeds
Pet food

Fatty Acids & Glycerine

Insecticides
Weed Killers
Lubricants
Oil Polishes

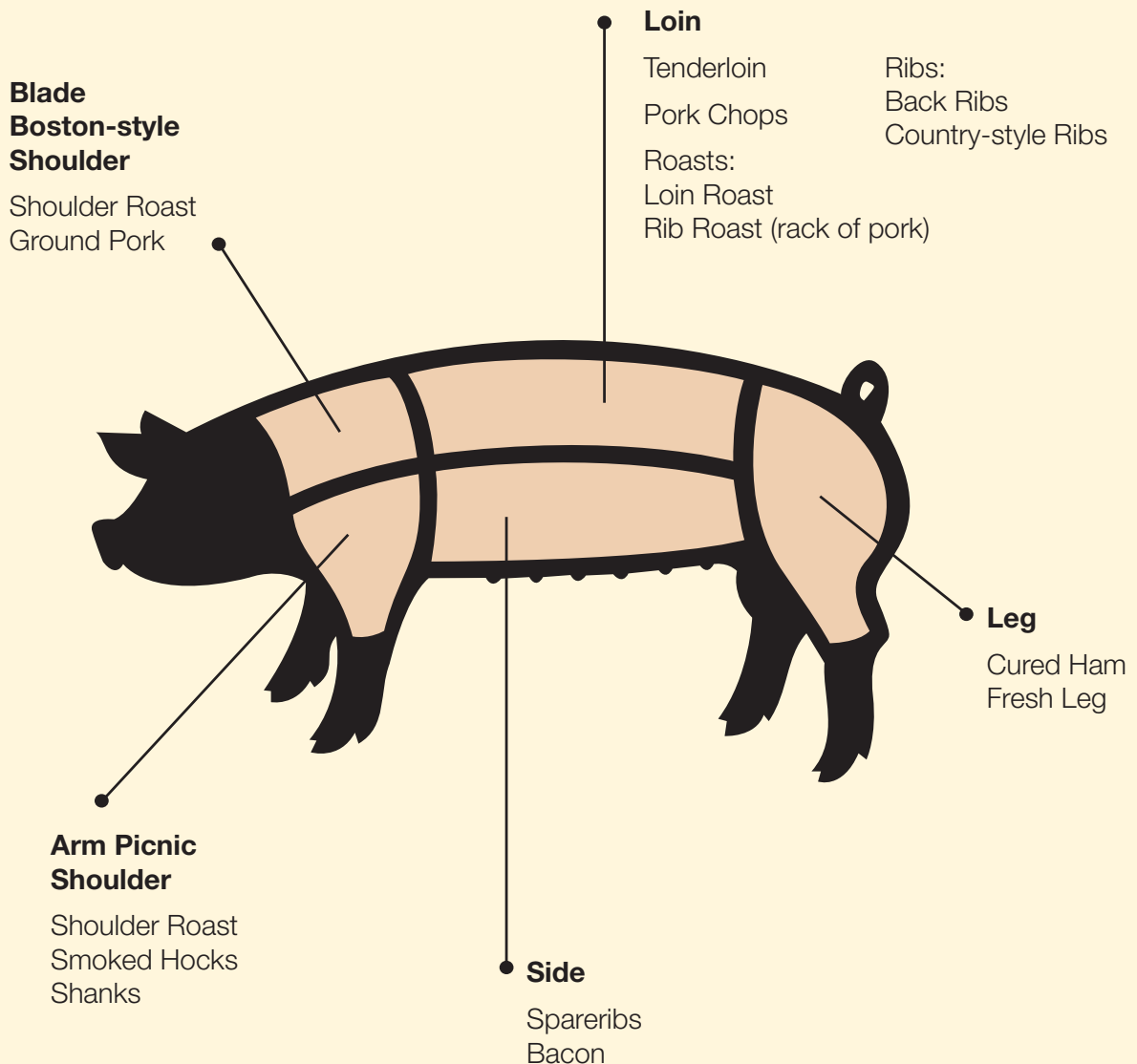
Rubber

Cosmetics
Antifreeze
Nitroglycerine
Plastics
Plasticizers
Printing Rollers
Cellophane
Floor Waxes
Waterproofing Agents
Cement
Fiber Softeners
Crayons
Chalk

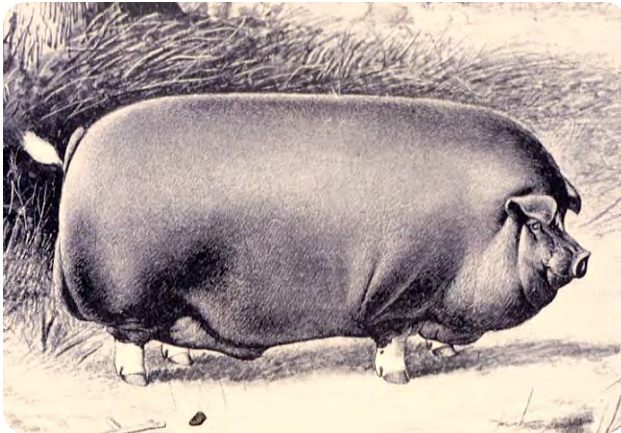
Phonograph

Records
Matches
Putty
Paper Sizing
Insulation
Linoleum

Know Your Pork Cuts



History of Pork



The History of Pork

The pig dates back 40 million years to fossils, which indicates that wild pig-like animals roamed forests and swamps in Europe and Asia. By 4900 B.C., pigs were domesticated in China, and by 1500 B.C., they were being raised in Europe.

On the insistence of Queen Isabella, Christopher Columbus took eight pigs on his voyage to Cuba in 1493. However, it is Hernando de Soto who could be dubbed “the father of the American pork industry.” The explorer landed with America’s first 13 pigs at Tampa Bay, Fla., in 1539.

Native Americans reportedly became very fond of the taste of pork, resulting in some of the worst attacks on the de Soto expedition. By the time of de Soto’s death three years later, his pig herd had grown to 700 head, not including the ones his troops had consumed, those that ran away and became wild pigs (the ancestors of today’s feral pigs or razorbacks) and those given to the Native Americans to help keep peace.

America’s Pork Industry Had Begun

Pig production spread throughout the new colonies. Hernando Cortez introduced hogs to New Mexico in 1600, and Sir Walter Raleigh brought sows to Jamestown Colony, now in Virginia, in 1607.

Semi-wild pigs conducted such rampages in the grain

fields of New York that colonists who owned a pig 14 or more inches high had to put a ring in the pig’s nose. On Manhattan Island, a long solid wall was constructed on the northern edge of the colony to control roaming herds of pigs, as well as to protect the colonists from native Americans. This area is now known as **Wall Street**.

The pig population in the Pennsylvania colony numbered in the thousands by 1660. As the 17th century closed, the typical farmer owned four or five pigs, supplying salt pork and bacon for his table, with surpluses sold as barreled pork. Following a practice that had become common in Pennsylvania, pigs were fed a diet of native American corn.

After the Revolutionary War, pioneers began heading west, taking their indispensable pigs with them. A wooden crate filled with young pigs often was hung from the axles of prairie schooners.

As western herds grew, so did the need for pork processing facilities. Packing plants began to spring up in major cities. Pigs were first commercially harvested in Cincinnati, which became known as **Porkopolis**. More pork was packed there than any other place in the mid-1800s.

“Drovers” Herd Pigs to Market

Moving pigs to market in the 1850s was no small undertaking. “Drovers” herded their pigs along trails, which later developed into railroad routes. Between





40,000 and 70,000 pigs were driven from Ohio to eastern markets in any one year. Drivers, the drovers' hired hands, each managed up to 100 hogs, and the herds moved five to eight miles a day, covering distances up to 700 miles.

The refrigerated railroad car transformed the meat industry when it was introduced shortly after the Civil War. It enabled packing plants to be centralized near points of production instead of near points of consumption. Large **"terminal markets"** with railroad access developed in major cities, such as Chicago, Kansas City, St. Joseph, Mo.; and Sioux City, Iowa. Large packing plants were located adjacent to these stockyards. Live pigs were shipped via railroad to the markets, and pork was shipped, again mainly by rail, to consumers nationwide.

As a result of these transportation developments, the pork industry relocated to the upper Midwest, where ample amounts of feedgrains were produced, and the **"Corn Belt"** also became known as the **"Hog Belt."** In fact, Iowa, Illinois, Minnesota, Nebraska, Indiana and Missouri held the top six spots in state rankings for pork production for many years. Iowa is still No. 1.

The 1980s and 1990s brought major technological developments in the pork industry, some of which allowed production to grow dramatically in states not known for pig production. The most notable growth occurred in North Carolina, which is now the second largest pork-producing state.

Despite inherently more expensive feed, North Carolina producers became cost competitive by using pigs with the genetic capability for higher reproductive efficiency and enhanced lean muscle growth, resulting in better feed efficiency. They also captured economies of size and developed pig-raising methods that controlled disease, and improved productive efficiency. Many producers in other areas have now adopted these same methods.

Today the United States is one of the world's leading pork-producing countries. Also, the U.S. became the largest pork exporter in 2005 and remains so today. U.S. production accounted for 10.5 percent of total world supply in 2008.

You can find more informatin about today's U.S. pork industry in the rest of this book. And for more information, go to the Pork Checkoff's Web site at pork.org or call the Producer Service Center at (800) 456-PORK (7675).

Timeline

1954 National Swine Growers Council formed to pursue goal of developing a leaner, meat-type hog and to develop more pork-specific promotion funding.

1966 Meeting of 90 pork producers – the “Moline 90” – in Moline, Ill., results in \$40,000 “Get Ready” fund to launch a national voluntary market checkoff.

1967 The first voluntary market checkoff funds are collected in six pilot counties in Iowa and Illinois.

1968 Pork industry launches first national, pork-specific voluntary producer checkoff. Called “Nickels for Profit,” the program is based on a checkoff of five cents per hog.

1972 Pork industry starts celebrating October as National Pork Month.

1977 Voluntary producer checkoff is raised to 10 cents per head.

1985 The Pork Promotion, Research and Consumer Information Act of 1985 is signed into law. Known as the Pork Act, it provides a national, legislative Checkoff on sales of market hogs, breeding stock, imported hogs and pork products.

1986 National legislative Checkoff begins, with initial rate at 0.25 of one percent of the market value of each hog.

1987 The well-known national promotion campaign, *Pork. The Other White Meat®*, is introduced and through the Pork Checkoff



begins repositioning pork as a lean, nutritious protein source.

 The Other White Meat®

1988 The first World Pork Expo at the Iowa State Fairgrounds in Des Moines, Iowa, attracts 60,000 people.

1989 The Checkoff's Pork Quality Assurance® (PQA) Program is introduced. The producer education and management program emphasizes good management practices in the handling and use of animal health products.

1989 Technology developed with producer Checkoff funds is used by McDonald's nationally to market The McRib® pork sandwich.

1990 The Checkoff-funded Market Basket Study examines the nutrient composition of pork at supermarkets nationwide. It reinforces the Pork. The Other White Meat® slogan, and shows that pork is, on average, 31 percent leaner than it was 10 years before due to pork producers responding to consumers wanting leaner pork. Notably, the study identifies the eight cuts of pork that are as lean as chicken.



- 1991** The Checkoff rate increases to **0.35 of one percent of value** (35 cents per \$100 value).
 - 1995** Through Checkoff-funded promotions and focus on market development activities, the United States becomes **a net exporter** of pork for the first time in more than 40 years.
 - 1995** At the request of producers, Pork Checkoff increases to **0.45 of one percent** (45 cents per \$100 value). This checkoff rate stays the same until 2002.
 - 1995** The **Environmental Assurance Program (EAP)** is launched to help producers meet environmental challenges.
 - 1995** Results of the Checkoff-funded **Terminal Line Genetic Evaluation Program** are released. It is the largest unbiased study of genetic lines in U.S. pork industry.
 - 1996** The **second Market Basket Study** confirms the comparable fat content between pork cuts and poultry cuts. This Checkoff-funded study also reinforces the initial Market Basket Study that provided revised data for USDA's pork nutrient database, which continues to be used by nutritionists as a standard food reference.
 - 1998** The U.S. government imposes **Hazard Analysis Critical Control Point (HACCP)** rules on packers. The Pork Quality Assurance® (PQA) Program provides producers a mechanism to comply.
 - 1998** United States becomes the **second largest pork exporter** in the world.
-
- 2000** A Northwestern University study ranks the *Pork. The Other White Meat*® slogan as the **fifth most recognized tagline** in contemporary advertising.
 - 2000** The Pork Checkoff plays a key role in shaping the U.S. Department of Agriculture's **point-in-time national study** of the U.S. swine industry. Results are distributed in the National Animal Health Monitoring System (NAHMS).
 - 2001** Changes from the **Pork Checkoff agreement with USDA** take effect July 1. The Pork Checkoff has its own location, accounting system and staff to expand domestic and foreign markets, conduct research and provide consumer information.
 - 2001** The Checkoff-funded **Transport Quality Assurance™ (TQA)** program starts, providing information on proper techniques to use when handling, loading and transporting hogs. By 2005, 330 trainers are certified to administer TQA examinations and more than 10,000 drivers are certified in the program.
 - 2002** The Pork Checkoff rate drops 5 cents, to **\$0.40 per \$100 of value** for hogs sold in the United States.
 - 2002** The new Pork Checkoff Service Center, now called the Producer Service Center, is launched to answer calls from individual pork producers at (800) 456-PORK (7675).

2002 Checkoff-funded research determines that consumers spend an average of four minutes deciding what to buy in the meatcase, compared with one minute in other parts of the store. By showing that consumers take time to make their decisions at the meatcase, this research indicates that point-of-purchase promotions can be an effective way to bring pork to their attention.

2002 Pork Checkoff launches **Consumer's Choice Pork AwardsSM** to showcase best new pork-based products in supermarkets.

2002 Checkoff-funded research leads to the development of **Biosecurity and Security Guides**.

2003 The Pork Checkoff launches the **Swine Welfare Assurance ProgramSM** supported by science-based research. The education and assessment program allows producers to demonstrate the care and well-being of their animals. This initiative was led by the pork producer members of the Animal Welfare Committee.

2003 The Pork Checkoff has two primary Internet sites: pork.org primarily for pork producers and TheOtherWhiteMeat.com for consumers.



2003 The United States continues to export more pork, setting a new record for pork exports for the 12th consecutive year.

2003 More than 480 producers participate in promotions related to Checkoff's racing sponsorship. Some 61.7 million pounds of pork were sold in race-related promotions, up nearly 15 million pounds from 2002.



2003 Checkoff-funded retail promotions help sell more pork. In 2003, the Checkoff invested \$1.1 million in retail promotions, or about 42 percent of the cost of the promotions. Retail partners sold 573 million pounds of pork, 16 percent more than during 2002.

2004 The **Pork Quality AssuranceTM** program celebrates 15 years of helping pork producers contribute to a healthy and safe food supply. Pork Checkoff launches the Youth PQA Program for youth ages 9 to 18.

2004 The Pork Checkoff creates the **Animal Science Committee** to serve producer needs for production and animal science-related information and research.

2004 The Pork Checkoff expands the **Hispanic Marketing** program to a dozen markets from five, continuing to share information that pork is lean and nutritious. The Hispanic Marketing initiative starts with Checkoff-funded research in 2001.

2004 The **Operation Main Street** program is launched to help train producers to share pork's positive story, helping those



not in pork production understand the value and importance of pork production to their local community.

- 2004** An advertising and information campaign for consumers who are counting carbohydrates is launched. New ads point out pork's great taste and versatility: "Not all proteins are created equal."
- 2004** TheOtherWhiteMeat.com is the Checkoff's direct connection to consumers on the Internet. On average, more than 60,000 unique visitors come to TheOtherWhiteMeat.com each month.
- 2004** Through the Pork Checkoff, seven distance learning courses allow producers and their employees easy access to the latest production information via CD-ROM or the Internet.
- 2005** The Pork Checkoff successfully launches the new *Don't be blah™* campaign, an extension of *The Other White Meat*, to revitalize pork and reconnect with consumers.
- 2005** America's pork producers continue to grow sales abroad, with the United States becoming the largest pork exporter.
- 2005** The Checkoff launches the *Take Care™: Use Antibiotics Responsibly* program, which defines how antibiotics should be used in pork production. This program helps identify pork producers as responsible stewards and caretakers, who are concerned with public health.



2006 The Pork Checkoff's Porcine Reproductive and Respiratory Syndrome (PRRS)

Initiative, has funded 18 research projects.

Research needs are identified and prioritized so the USDA, university researchers, Extension personnel, animal health companies, state and federal agencies and swine veterinarians can work together to map out a plan to successfully manage and eliminate PRRS in the U.S. swine herd. It is estimated that PRRS costs U.S. producers \$650 million annually.



- 2006** The Pork Checkoff and the Soybean Checkoff partner to create an informational campaign to help spread the word about the positive impact pork producers have on the local community.

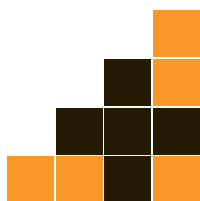
2006 A Web-based **Air Management Practices Assessment Tool** is designed to assist producers in identifying practices to address air quality issues on their farm in the areas of animal housing, manure storage and land application.

2007 A study of the **economic value of Pork Checkoff programs** concludes that the Checkoff has a significantly positive effect on the demand for hogs and pork. Specific results indicate that producers would gain an additional \$13.80 for each additional \$1 of program expenditures.

2007 Over 1,600 Operation Main Street presentations reach over 44,000 people. The **Neighbor-to-Neighbor program**, a three-hour short-course to help producers answer tough questions, trains 715 producers.

2007 U.S. Pork exports broke records for **the 16th consecutive year**. Exports totaled 1.3 million metric tons, nearly 2.9 billion pounds, at a value exceeding \$3.15 billion.

2007 The **Pork Quality Assurance® Plus (PQA Plus®)** program is introduced to pork producers at World Pork Expo. The workable, affordable, credible on-farm program answers customers' questions about animal care and food safety. Over 5,300 producers are certified.



PQA PLUS®
Our Responsibility. Our Promise.

2008 The Pork Checkoff launches **The Other White Meat® Tour**, designed to involve consumers in a pork experience. The tour reaches pork's consumer target audience with stops at 23 high-traffic events across the U.S. The tour stops celebrate pork's positive benefits through cooking demonstrations, product sampling and one-on-one interactions.



2008 Historically **unprecedented high feed costs** lead to one of the most challenging times in history for pork producers. The blow, softened only by record-high market hog prices, causes many producers extreme financial distress. The Pork Checkoff provides producers tools to work with their lenders and information to help weather the storm, including how to take advantage of marketing opportunities and identify opportunities to improve efficiency in their production.

2008 Pork's new spokesperson **Guy Fieri (below)**, one of the rising stars of the **Food Network Channel**, excites consumers about pork's personality, flavor and fun during promotions.





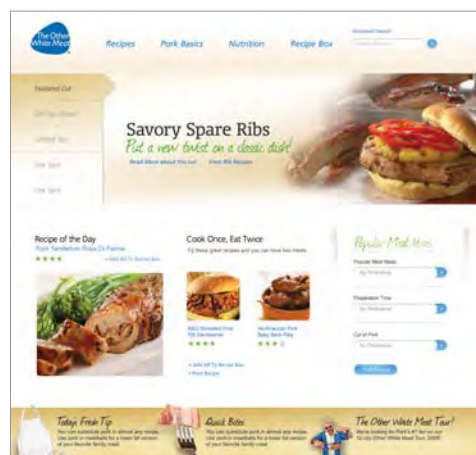
2008 The **We Care**, joint industry initiative is launched to help build consumer trust. Six ethical principles outline producers' commitment to producing safe food, while protecting animal well-being, natural resources, public health and the environment, as well as contributing to their communities.

2009 Beginning in April, **news coverage of H1N1**, or "swine flu" as it was erroneously referred to by the media, added to an already challenging economic time for producers. It was estimated that producers lost more than \$2 billion after the outbreak of H1N1.

2009 Over 40,000 producers and employees are certified in **PQA Plus**®, the most ever since

the program's inception in 1989. And over 7,000 on-farm site assessments are completed, representing nearly 30 percent of the total U.S. hog inventory.

2009 The redesigned **TheOtherWhiteMeat.com** Web site features over 1,700 recipes and a new look to make it even easier for consumers to find the basics on pork cooking. The site remains the Checkoff's go-to source for all things pork for consumers.



2009 **Operation Main Street** celebrates its 5th anniversary. More than 750 participants have made over 3,500 presentations, reaching millions of people through their talks and media coverage.



Pork Production Today

Types of Operations

Today, pork production combines many inputs into a complex process of converting feedgrains, high-protein feed ingredients, vitamins, minerals and water into live hogs and eventually, pork and pork products. This ultimate goal is attained by five basic production systems:

- **Farrow-to-finish farms** that involve all stages of production, from breeding through finishing to market weights of about 265 pounds.
- **Farrow-to-nursery farms** that involve breeding through marketing 40- to 60-pound feeder pigs to grow-finish farms.
- **Farrow-to-wean farms** that involve breeding through marketing 10- to 15-pound weaned pigs to nursery-grow-finish farms.
- **Wean-to-finish farms** that involve purchasing weaned pigs and finishing them to market weights.
- **Finishing farms** that buy 40- to 60-pound feeder pigs and finish them to market weight.

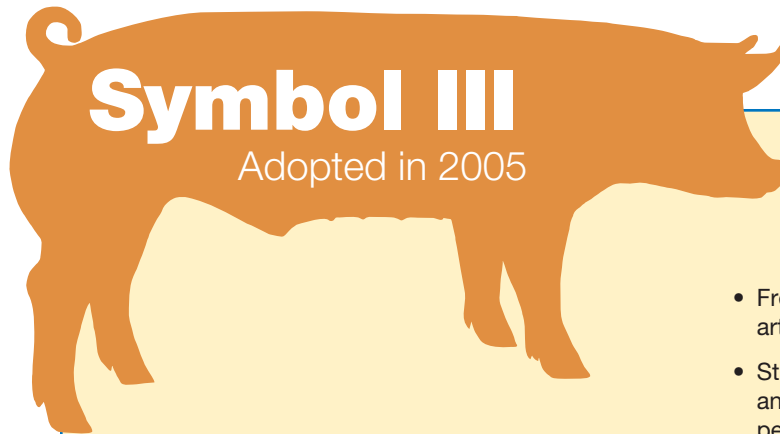
Feed is the major production input to the pork production process. In fact, feed accounts for more

than 65 percent of all production expenses. The average whole-herd feed conversion ratio, or pounds of feed required per pound of live weight produced, for the U.S. pork industry is about 3.0 to 3.2 and is improving (getting lower) steadily. This figure includes the feed fed to boars and sows.

For comparison, consider that beef cattle take 7 to 10 pounds of feed to produce a pound of live weight, and broiler chickens require about 2 pounds of feed per pound of live weight produced. The most efficient U.S. swine herds have whole-herd feed conversion ratios under 3.0.

A variety of feed ingredients is used in proper proportions to produce “**balanced**” diets for pigs at each stage of their development. Corn, barley, milo (grain sorghum), oats and sometimes wheat are used to provide dietary energy in the form of carbohydrates and fat. In 2009, corn usage was 1.07 billion bushels and soybean usage was 425 million bushels. Corn usage was lower than in recent years due to the substitution of distillers dried grains with solubles (DDGS), a by-product of ethanol production, for corn in pig diets.





SYMBOL III is an ideal market hog that symbolizes profitability for every segment of the industry. This hog has correctness of structure, production, performance, function, livability, attitude, health and optimum lean yield. **SYMBOL III** also produces the best quality, safest pork that provides the optimum nutrients for human nutrition.

Production Characteristics

- Live-weight feed efficiency of 2.4 (2.4)
- Fat-free lean gain efficiency of 5.9 (5.8)
- Fat-free lean gain of 0.95 lbs. per day
- Marketed at 156 (164) days of age
- Weighing 270 pounds
- All achieved on a corn-soy equivalent diet from 60 pounds
- Free of all internal and external parasites
- From a high-health production system
- Immune to or free of all economically important swine diseases
- Produced with Environmental Assurance
- Produced under Pork Quality Assurance® B^{ge} and Transport Quality Assurance™ guidelines
- Free of the Stress Gene (Halothane 1843 mutation) and all other genetic mutations that have a detrimental effect on pork quality.
- Result of a systematic cross-breeding system, emphasizing a maternal dam line and a terminal sire selected for growth, efficiency and superior muscle quality
- From a maternal line weaning >25 pigs/year after multiple parities

- Free of all abscesses, injection-site blemishes, arthritis, bruises and carcass trim
- Structurally correct and sound, with proper angulation and cushion and a phenotypic design perfectly matched to the production environment
- Produced in a production system that ensures the opportunity for stakeholder profitability from the producer to retailer while providing a cost competitive product retail price in all domestic and export markets
- Produced from genetic lines that have utilized genomic technology to support maximum improvement in genetic profitability and efficiency

Carcass Characteristics

- Hot carcass weight of 205 lbs.
- LMA of 6.5 (7.1)
- 10th rib backfat of 0.7 (0.6) inch
- Fat-Free Lean Index of 53.0 (54.7)

Quality Characteristics

- Muscle color score of 4.0
- 24-hour pH of 5.9
- Maximum drip loss of 2.5 percent
- Intramuscular fat level of 3.0 percent
- Free of within-muscle color variation and coarse muscle texture
- Free of ecchymosis (blood splash)
- Provides an optimum balance of nutrients important for human nutrition and health
- Provides a safe, wholesome product free of all violative residues and produced and processed in a system that ensures elimination of all food-borne pathogens

Note: Numbers in parentheses represent gilt numbers corresponding to the barrow numbers shown

Oilseed meals, mainly soybean meal, are the major source of protein, the building block of muscle and other organs. Vitamins and minerals, such as calcium and phosphorous, also are included in balanced diets.

Young pigs usually are fed a diet containing 20 to 22 percent crude protein. Diets are changed when pigs reach pre-determined weights in order to balance the amounts of nutrients that the pigs consume with what they actually need. The balanced diets improve growth and performance, while reducing the amount of nutrients excreted. Crude protein levels usually drop by increments of 2 percent until pigs are consuming a 13 to 15 percent crude protein diet at finishing. Concentrations of other nutrients are changed in a similar fashion.

Pig diets are produced in a variety of ways. Many producers have on-farm feed mills and mix their own feed from individual ingredients. Others use home-grown grain and either a commercial protein supplement that contains all of the protein, vitamins and minerals needed or add a protein meal (soybean, canola, peas) and a premix that contains only vitamins and minerals. Finally, some farms purchase complete rations from feed manufacturers that require no further processing or mixing.

Genetics for Leaner Pork

Today's pigs are bred and fed to be leaner than the pigs of yesteryear. Compared with pigs from the 1950s, today's model has slimmed down considerably, with 75 percent less fat. Around World War II, pigs averaged 2.86 inches of backfat compared with less than 0.75 inches today. At the time, lard was in demand for use in manufacturing ammunition.

Consumers, and consequently packers, prefer lean pork, and producers are raising leaner, heavier-muscled pigs to satisfy these demands. The leaner pork is the result of new technologies in hog production and superior genetics. Producers use purebred seedstock of eight major swine breeds, which are:

- **Yorkshire (or Large White),**
- **Duroc,**
- **Hampshire,**
- **Landrace,**
- **Berkshire,**
- **Spotted,**
- **Chester White**
- **Poland China**

Major Swine Breeds



Berkshire



Chester White



Landrace



Yorkshire



Hampshire



Duroc



Poland China



Spotted

Producers also use various genetic lines derived from these breeds. Virtually all market pigs are produced by crossing purebred breeds or using multi-genetic lines to take advantage of heterosis or hybrid vigor.

Heterosis is a biological phenomenon in which the offspring of a mating of two separate breeds or lines performs better than the average of their parents. Crossbred offspring, such as the pork industry's SYMBOL III (described on the previous page) grow faster, have lower mortality rates and convert feed to meat more efficiently. Symbol III is a visual image of the ideal pig.

Rotational breeding systems involve the successive use of boars of different breeds and the retention of gilts that are superior for growth rate, leanness and reproductive potential (as evidenced by their mothers' reproductive record). These systems reduce out-of-pocket breeding stock expenses since replacement females are home-raised.

However, the retention of gilts from all sires means that all sires must be selected for superior genetic potential for carcass (backfat, muscling), production (feed efficiency, growth rate) and reproduction (pigs per litter, milking ability) traits. Boars that are above average in all three types of traits are not likely to be truly superior in any one area.

Terminal breeding systems involve crossing boar lines selected strictly for carcass and production traits with gilt lines that are selected mainly for reproductive potential. These matings, usually involve artificial insemination (AI) and produce offspring that are all marketed (therefore the name "terminal"), with no gilts retained for breeding.

Since terminal boars are selected without concern for reproductive potential (remember that no gilts will be kept from the matings), ones that are truly exceptional for carcass and production traits can be used for breeding. The same is true of gilt lines. Emphasis can be placed on reproduction, with other traits being important but secondary.

Gilt lines used in modern terminal breeding systems involve mainly the white breeds – Yorkshire, Landrace and Chester White. These breeds are generally superior in reproductive traits, such as litter size, milk production and docile temperament. Most



terminal sire lines use the colored breeds, which are generally more durable, leaner and heavier muscled.

A major change in the pork industry since 1980 has been the shift from rotational to terminal breeding systems. This change was brought about largely by pig-pricing systems that explicitly reward leaner hogs and penalize fatter pigs, as well as a more thorough understanding of the economic importance of high reproductive efficiency. Today, the majority of pigs in the U.S. are produced from terminal breeding systems.

Many of the most modern pork production systems have gone to a closed-herd concept, where all the breeding females are produced in-house. Genetic advances are made strictly through the use of boar semen brought in from the outside. The major advantage of this system is that it reduces possibility of introducing any new diseases to the operation and thus enhances pigs' health status.

Swine Production Systems

Whether pigs are raised in pastures or in enclosed barns, systems approaches dominate pork production. Repeatable methods and specialization characterize the modern pork producers regardless of the type of facilities that they use.

Housing System	Description	Benefits	Challenges
 <p>Barn (Confinement)</p>	<ul style="list-style-type: none"> • Either naturally or mechanically ventilated, or a combination of the two, depending on the season. • Bedding optional. • Can accommodate group and individual housing. 	<ul style="list-style-type: none"> • Reasonable control of the environment. • Separation of manure from the pig resulting in fewer opportunities for disease transmission. • Easy to clean and disinfect. • Multiple pens allow for split-sex feeding and separation of pigs by weight. • Excellent parasite control opportunities. • Multiple pens and feeders allow for age-appropriate diets to be fed. • Less time required for observing and managing pigs. 	<ul style="list-style-type: none"> • High capital investment in a single purpose building. 
 <p>Hoop Barn</p>	<ul style="list-style-type: none"> • A lower-cost facility. • Deep bedding used to absorb manure, which is handled as a solid. • Usually used for gestation and grow-finish pigs. • Group sizes often 100 or more. 	<ul style="list-style-type: none"> • Low investment cost per pig. • Multiple-use building (can be used for other storage purposes if not for pigs). • Reasonable control of the environment with adequate bedding. 	<ul style="list-style-type: none"> • Lots of bedding required plus a place to store the bedding. • Can be difficult to cool pigs in hot, humid weather. • More difficult to identify and treat sick pigs. • Difficult to clean and disinfect. • Difficult to separate pigs from the manure. • More time required for handling and bedding pigs.
 <p>Pasture</p>	<ul style="list-style-type: none"> • Used for all stages of production, with obvious seasonal limitations for winter production in some parts of the United States. • Pasture production systems involve intensive production management and pasture rotation. • Low cost of facilities, but the opportunity cost of the land for crop production must be considered. 	<ul style="list-style-type: none"> • Ability to disperse pigs over a large area. • Low cost of facilities. • Quality forage on the pasture can meet a portion of pigs' nutritional needs. • Ability to root and forage. 	<ul style="list-style-type: none"> • Minimal control of the environment. • Difficult to clean and disinfect, requiring adequate pastures to allow for rotation to clean ground each year. • Controlling predators necessary. • Control of diseases spread by wild animals. • Managing in cold, hot or rainy weather. • Parasite control needed. • More time required for individually treating and handling pigs. • Ground cover needs to be maintained.

The choice of facility type is mainly a balancing of capital investment, labor requirement and management expertise. Animal and worker well-being are primary concerns to producers, regardless of the type of facilities chosen. The key to good swine care rests more on the producer's ability to properly manage housing than it does on the specific type of housing provided.

Controlled-environment buildings require a much higher investment but lower labor per unit of output. These facilities make handling hogs easier, provide for more direct observation of animals, allow greater control of the production process, protect both animals and workers from the heat, cold, rain and snow, and usually result in faster growth to market weight, along with better feed efficiency.

Most controlled-environment facilities are operated in "all-in/all-out" fashion where pigs are moved in groups, and buildings are thoroughly cleaned and disinfected between groups. Controlled-environment facilities take little land, leaving more available for grain production.

Pasture or outdoor production systems involve more acres of land and more labor per unit of output. They require generally lower capital investment, especially when marginal land can be used, but usually give lower productivity in terms of output per unit of land or labor or feed. Interest in outdoor or pasture facilities has increased in recent years as "systems" ideas have been imported from Europe and as some niche markets have developed for meat from pasture-raised pigs.



Regardless of type of facilities used, the objective is the same: To provide the proper environment to maximize the well-being and productivity of both animal and the workers.

Breeding and Gestation

The design of breeding facilities depends largely on the type of mating system used.

Pen mating, where one or more boars are placed with a group of sows, is frequently used in pasture systems. This approach requires little labor but provides little information about when, or even if, a sow is actually bred.

Hand-mating predominates in controlled-environment facilities and can be used in outdoor facilities, as well. This method involves placing one boar with one sow and observing to make sure that a mating occurs. This takes more labor, but it results in very accurate information to use in making future management decisions.

Artificial insemination (AI), the predominant breeding method on farms of all sizes, allows improved genetic material to be introduced faster and minimizes the risk of disease transmission. AI's greatest value is in controlled-environment facilities where breeding efficiency is a major factor that impacts profitability.

AI involves no boar on site and requires the highest level of management expertise and labor of all the alternative mating systems. Commercial boar studs meet the demand for semen from genetically superior boars.

Sows can be housed in groups on pasture, in groups in controlled-environment buildings or individually in controlled-environment buildings during breeding and their 114-day gestation (pregnancy). Boars usually are housed in the same way as sows.

The type of housing offered to gestating sows has been a topic of debate for many audiences. The available science shows that both individual and group housing systems are acceptable for providing for the well-being of the sow. Regardless of the system used, the caretaker's husbandry skills and ability to provide good care most influences the well-being of the sow.

The American Veterinary Medical Association (AVMA) and the American Association of Swine Veterinarians (AASV) have reviewed existing scientific literature on gestational sow housing and have published position statements that concluded that both types of housing types have advantages and disadvantages. They also concluded that regardless of the type of housing system in use, the system should:



- Minimize aggression and competition among sows.
- Protect sows from detrimental effects associated with environmental extremes, particularly temperature extremes.
- Reduce exposure to hazards that result in injuries, pain, or disease.
- Provide every animal with daily access to appropriate food and water.
- Facilitate observation of individual sow appetite, respiratory rate, urination and defecation, and reproductive status by caregivers.
- Allow sows to express most normal behavior patterns.

Farrowing

Farrowing facilities range from pasture systems with small, individual sow huts to enclosed farrowing houses that are part of either partial or totally controlled-environment operations.

Farrowing houses contain individual farrowing pens or stalls designed to provide a place for the sow to farrow and to protect both newborn pigs and workers. These facilities protect newborn pigs from

being crushed by sows that sometimes accidentally lay on them and also prevent injury to pigs or workers if the sow's protective instincts cause aggressive behavior. Farrowing buildings are thoroughly cleaned before sows enter, and farrowing pastures are rotated in order to control disease.

Farrowings average 10 to 12 pigs per litter (with a practical range of 6 to 13). In 2009, the average number of pigs weaned per litter in the U.S. was about 9.6. Baby pigs are carefully observed to keep mortality to a minimum and to ensure rapid early growth and development.

The highest losses of the entire pork production process occur within three or four days of birth, and these losses are costly. It may cost a producer \$700 to \$725 a year to keep a sow. If she raises 20 pigs during that year, the cost per pig is \$35 to \$38. However, if a sow raises 25 pigs, the cost per pig falls to \$28 to \$30.

With this in mind, producers follow many steps to ensure the survival of each pig. Newborn piglets need special attention because they are born with little stored energy, have little ability to regulate their own body temperature and can easily be injured by the sow.

After birth, several procedures may be performed on piglets to improve their survival chances and/or to prevent future problems. These may include disinfecting navels to prevent infections, clipping needle teeth to prevent injuries to other pigs or the sow, giving supplemental iron to improve the blood's oxy-



do so. Producers realize that pigs are living beings and as such, they must receive a level of care that promotes their well-being. At minimum, U.S. pork producers commit to:

- Provide feed, water and an environment that promotes the well-being of their animals.
- Provide proper care, handling and transportation for pigs at each stage of life.
- Protect pig health and provide appropriate treatment, including veterinary care, when needed.
- Use approved practices to euthanize, in a timely manner, those sick or injured pigs that fail to respond to care and treatment.

Pork producers realize that consumers of pork are increasingly interested in how the animals used to produce meat are raised and trust that those animals were raised in a way that ensured their well-being. Also, good animal care provides an economic advantage. Animals that are cared for appropriately grow faster and more efficiently than those that are not. Good animal care practices promote good health, which reduces production costs associated with veterinary services and animal health products.

We Care Initiative

The pork industry's We Care initiative, a joint effort of the Pork Checkoff and the National Pork Producers Council, helps demonstrate that pork producers are committed to the well-being of their animals. We Care also encompasses producers' pledge to produce safe food, while being good stewards of the environment and being good neighbors.

The pork industry offers numerous programs, including Pork Quality Assurance® Plus (PQA Plus®) and Transport Quality Assurance® (TQASM), to support animal well-being and maintain a safe, high-quality supply of pork. The We Care initiative ties everything together to help the public view the pork industry as a self-regulated business that earns the trust of others.

Other programs that producers can take part in to support the We Care initiative include **Operation Main Street**. The program helps pro-



ducers and other industry spokespeople connect with community leaders and the general public through presentations given in their communities.

Education Programs for Swine Care in the United States

To fulfill its mandate of providing knowledge and opportunities that enable producers to be competitive, the Pork Checkoff has developed several education and certification programs. These programs are designed to help producers tackle issues facing modern pork production.

Several Checkoff-funded programs, such as the **Pork Quality Assurance® Plus (PQA Plus®)** and the **Transport Quality Assurance® (TQA®) programs** are considered industry standards.

U.S. Pork producers have a long tradition of social responsibility. The tradition includes the development of producer certification programs that producers can use to ensure that U.S. pork products are of the highest quality and safe, and that the animals raised for food are cared for in a way that ensures their well-being.

In 1989, pork producers developed the Pork Quality Assurance® program, a producer education and certification program to reduce the risk of violative animal health product residues in pork. The program, better known as PQA®, was modeled after the Hazard Analysis Critical Control Point (HACCP) programs used by food manufacturers to ensure the safety of food products, but customized for on-farm use.

PQA was designed to identify the practices with potential to result in a food safety hazard and minimize this potential risk through producer education on relevant on-farm practices. The success of the program was demonstrated by significant producer participation, customer acceptance and more importantly, a measurable reduction in the instances of violative residues in pork. The program has been revised several times, with updated content taken from new scientific knowledge, and to address the evolving industry and changing production practices.

As consumers show greater interest in the attributes of the products they purchase for food, their interest in the well-being of the animals raised by pork producers has come to the forefront. Producers understand this and since the mid-1990s have had programs and educational materials in place to help them care for their animals in a manner that promotes animal well-being.

Pork Quality Assurance® Plus

In 2007, PQA evolved into PQA Plus® to reflect increasing customer and consumer interest in the way food animals are raised. PQA Plus was built as a continuous improvement program. Maintaining its food-safety tradition to ensure that U.S. pork products continue to be recognized domestically and internationally as the highest quality and safest available, it also provides information to ensure producers can measure, track and continuously improve animal well-being. With PQA Plus, pork producers have another tool to demonstrate that they are socially responsible.

The PQA Plus program achieves its goals through:



10 Good Production Practices

At the core of the PQA Plus program, 10 good production practices are used as guidelines for safe and responsible use of animal health products and for continually and objectively evaluating and, when necessary, improving animal care. They are:

- GPP 1 -** Establish and implement an efficient and effective herd health management plan.
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gen-carrying capacity, docking tails to prevent future injury and castrating boars to prevent aggression, as well as off-flavored meat.

Nursery

Pigs are generally weaned at 2 to 4 weeks of age when they weigh 10 to 15 pounds. At this time, they are moved to either a nursery, a grower or a **wean-finish building** designed to meet the needs of pigs from weaning to market weight.

Most housing for newly weaned pigs has slatted floors that allow pigs' waste to fall through into a holding pit or gutter. This keeps floors drier and cleaner, making it easier to provide the correct environment to keep pigs comfortable and healthy. The slotted floors are made of easily cleaned and maintained materials.

Complex diets consisting of grain, plant proteins, milk products and animal proteins are fed to newly weaned pigs. As many as five unique diets may be fed to a pig before it is moved out of the nursery facility at 8 to 10 weeks of age and 40 to 60 pounds. Pigs that were moved to wean-market buildings are simply changed to grower diets at this point.

Growing and Finishing

Growing and finishing were once thought of as distinct phases in the pork production process. The difference in terminology dates back to the time when fat was more valuable and "finishing" pigs meant feeding them to a sufficient degree of fatness. In fact, separate pens and even separate buildings were used for growing pigs (up to 120 pounds) and finishing pigs (120 pounds to market weight).

Today, pigs are seldom moved at 120 pounds, and the "**grow-finish**" phase comprises two to nine phases in which unique diets are fed to closely match pigs' nutritional requirements. Barrows and gilts are frequently fed separately during the grow-finish phase because their nutritional requirements are significantly different. "**Split-sex**" feeding results in leaner, meatier animals from fewer pounds of feed.

Either pasture or controlled-environment facilities may be used for the grow-finish phase. General types of buildings that are used include:

- **Totally enclosed, controlled-environment** – Usually the most costly but provides the greatest control over temperature and humidity. Electric fans provide ventilation.
- **Open front with outside apron** – Costs less to construct than other types, but because one side (usually the south) is always open, pigs are exposed to temperature variations that may reduce comfort and performance.
- **Double-curtain buildings** – Automatically controlled curtains on both sidewalls usually placed perpendicular to prevailing winds. A combination of mechanical and natural ventilation maintains proper temperatures and provides fresh air. Sometimes tunnel-ventilated, with big fans at one end, these buildings have been a major technological development. To be cost-competitive, these buildings must usually hold at least 800 pigs per all-in/all-out group.
- **Hoop buildings** – Hoop structures have wooden or concrete sidewalls that are three to four feet high upon which are mounted hoops. The hoops support covers made of specially treated fabric or plastic. Straw or cornstalks are used for bedding over dirt floors. Research shows that these buildings can provide cost-competitive all-in/all-out finishing facilities for as few as 200 pigs per group.

Animal Care

Pork producers care about their animals' well-being for several reasons. The main one is that producers feel the personal and moral responsibility to



OUR PLEDGE

On farms across America, we demonstrate our care and concern for how pork is produced.

It's a commitment that we take seriously, and we recognize the need to honor it in all we do.

No one has more on the line when it comes to responsible pork production than we do.

That's why we pledge to uphold these ethical principles every day.

PRODUCING SAFE FOOD

PROTECTING AND PROMOTING ANIMAL WELL-BEING

ENSURING PRACTICES TO PROTECT PUBLIC HEALTH

SAFEGUARDING NATURAL RESOURCES IN ALL OF OUR PRACTICES

PROVIDING A WORK ENVIRONMENT THAT IS SAFE

CONTRIBUTING TO A BETTER QUALITY OF LIFE IN OUR COMMUNITIES



do so. Producers realize that pigs are living beings and as such, they must receive a level of care that promotes their well-being. At minimum, U.S. pork producers commit to:

- Provide feed, water and an environment that promotes the well-being of their animals.
- Provide proper care, handling and transportation for pigs at each stage of life.
- Protect pig health and provide appropriate treatment, including veterinary care, when needed.
- Use approved practices to euthanize, in a timely manner, those sick or injured pigs that fail to respond to care and treatment.

Pork producers realize that consumers of pork are increasingly interested in how the animals used to produce meat are raised and trust that those animals were raised in a way that ensured their well-being. Also, good animal care provides an economic advantage. Animals that are cared for appropriately grow faster and more efficiently than those that are not. Good animal care practices promote good health, which reduces production costs associated with veterinary services and animal health products.

We Care Initiative

The pork industry's We Care initiative, a joint effort of the Pork Checkoff and the National Pork Producers Council, helps demonstrate that pork producers are committed to the well-being of their animals. We Care also encompasses producers' pledge to produce safe food, while being good stewards of the environment and being good neighbors.

The pork industry offers numerous programs, including Pork Quality Assurance® Plus (PQA Plus®) and Transport Quality Assurance® (TQASM), to support animal well-being and maintain a safe, high-quality supply of pork. The We Care initiative ties everything together to help the public view the pork industry as a self-regulated business that earns the trust of others.

Other programs that producers can take part in to support the We Care initiative include **Operation Main Street**. The program helps pro-



ducers and other industry spokespeople connect with community leaders and the general public through presentations given in their communities.

Education Programs for Swine Care in the United States

To fulfill its mandate of providing knowledge and opportunities that enable producers to be competitive, the Pork Checkoff has developed several education and certification programs. These programs are designed to help producers tackle issues facing modern pork production.

Several Checkoff-funded programs, such as the **Pork Quality Assurance[®] Plus (PQA Plus[®])** and the **Transport Quality Assurance[®] (TQA[®]) programs** are considered industry standards.

U.S. Pork producers have a long tradition of social responsibility. The tradition includes the development of producer certification programs that producers can use to ensure that U.S. pork products are of the highest quality and safe, and that the animals raised for food are cared for in a way that ensures their well-being.

In 1989, pork producers developed the Pork Quality Assurance[®] program, a producer education and certification program to reduce the risk of violative animal health product residues in pork. The program, better known as PQA[®], was modeled after the Hazard Analysis Critical Control Point (HACCP) programs used by food manufacturers to ensure the safety of food products, but customized for on-farm use.

PQA was designed to identify the practices with potential to result in a food safety hazard and minimize this potential risk through producer education on relevant on-farm practices. The success of the program was demonstrated by significant producer participation, customer acceptance and more importantly, a measurable reduction in the instances of violative residues in pork. The program has been revised several times, with updated content taken from new scientific knowledge, and to address the evolving industry and changing production practices.

As consumers show greater interest in the attributes of the products they purchase for food, their interest in the well-being of the animals raised by pork producers has come to the forefront. Producers understand this and since the mid-1990s have had programs and educational materials in place to help them care for their animals in a manner that promotes animal well-being.

Pork Quality Assurance® Plus

In 2007, PQA evolved into PQA Plus® to reflect increasing customer and consumer interest in the way food animals are raised. PQA Plus was built as a continuous improvement program. Maintaining its food-safety tradition to ensure that U.S. pork products continue to be recognized domestically and internationally as the highest quality and safest available, it also provides information to ensure producers can measure, track and continuously improve animal well-being. With PQA Plus, pork producers have another tool to demonstrate that they are socially responsible.

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- Producer training by a certified PQA Plus advisor which results in the producer receiving PQA Plus certification.
- An objective assessment of on-farm animal well-being which, when combined with the education of the producer through PQA Plus certification, results in the farm receiving PQA Plus site status.
- A PQA Plus survey designed to evaluate the implementation of PQA Plus in the industry. Survey results are used to identify opportunities for improvement of the program's information and delivery.

PQA Plus certification is valid for three years. To recertify every three years, producers must attend a PQA Plus training session with a certified PQA Plus advisor. Likewise, PQA Plus site status is valid for three years. An objective assessment of the well being of the animals on the farm is required for continuing a farm's PQA Plus site status. While site status is valid for three years, producers may work with their PQA Plus advisor to determine the frequency and timing of assessments and training.

Producer training and third-party on-farm assessments are performed by certified PQA Plus advisors. The network of certified PQA Plus advisors spans the United States. Certified advisors are veterinarians, animal scientists, university Extension specialists or ag educators with a bachelor of science degree in animal science or a related degree. They also must have two years of recent, documented swine production experience. Advisors must attend a PQA Plus training session and successfully pass an examination proving knowledge of the program, the implementation of training and the assessment.

Pork industry customers and consumers can be comfortable with the knowledge that U.S. pork products are produced following good production practices that address their safety and in a way that promotes animal well-being because of programs such as PQA Plus. PQA Plus demonstrates America's pork producers' will to commit and to make themselves accountable for the way they produce the pork products that feed the world. Because of this commitment, U.S. pork



is the safest in the world and is safer than it has ever been.

Transport Quality Assurance®

The **Transport Quality Assurance® (TQAsm)** certification program ensures that pigs in the United States are handled and transported in a manner that ensures their well-being. Coupled with PQA Plus®, the producer education and site assessment program that promotes food safety and animal well-being on the farm, TQA gives the industry the information necessary so that animals receive a high standard of management and care as they are moved or transported.

TQA certified individuals receive training in areas that have been identified as critical to the well-being of animals being moved within a facility or transported from one facility to another. Key learning objectives include an understanding of:

- Pig behavior, animal health and condition and the implications of these during handling, moving, loading or unloading and during transport.
- The need to maintain the health and well-being of the animals, on-farm and during transport.
- The differences between animals of different sizes and the proper handling and transporting techniques for each type of animal.
- The use and maintenance of equipment, facilities and transport vehicles to facilitate humane and safe handling and transport of animals.



- The responsibilities and requirements of all parties involved in the planning, handling and transport of animals between facilities.
- The potential risks associated with unplanned events (such as accidents, delays and plant shutdowns).
- Basic emergency response.
- The laws and regulations that apply to the transport and transporters of animals.
- The role livestock transporters play in the safety of the U.S. food supply, the image they project and the expectations the pork industry has of them.

Tens of thousands of pork producers, livestock transporters and personnel in charge of loading and unloading animals have received TQA training since the program's development in 2002. In parallel to the program's dissemination, the number of **animal losses and fatigued pigs that arrive at harvesting facilities has been significantly reduced**, according to industry experts. At the same time, pork quality defects caused by improper handling and/or transport of the animals also have been reduced.

These successes have been achieved through the TQA training of producers, pig transporters and animal handlers by certified TQA advisors. Advisors are qualified industry individuals who have completed TQA content and session facilitation training and who have successfully passed a comprehensive examination covering the program.

Thanks to TQA, pork industry customers and consumers can be assured that today's pork products are handled and transported following



practices that ensure food safety and the well-being of animals.

Marketing

When pigs reach about 260 to 270 pounds, producers sell them on either a live-weight basis at terminal markets or auctions, or on a live-weight or carcass-weight basis direct to packers. Also, some producers use livestock exchanges or producer-owned marketing networks for price negotiation and transportation.

As noted earlier, **terminal markets** developed in the late 1800s near packing plants in major metropolitan areas. These markets played a major role in the development of the U.S. livestock industry, but they have declined in importance in recent years as communications systems have improved and farms have become larger. Today, less than one percent of all pigs are sold through terminal markets.

Auction markets were organized in many rural communities to provide a point of sale for small lots of livestock from relatively small geographic areas. Like terminal markets, these markets are less numerous and handle fewer pigs today. They still provide needed price discovery and livestock assembly services in some areas, especially those distant from packing plants or terminal markets.

Producers also have the option of **selling directly to packers** and delivering pigs to the plant or to buying stations. This type of marketing has increased over the years and is now used for the vast majority of pigs produced.

More than 95 percent of the pigs produced in the United States are now sold on “carcass-merit” pricing systems in which a portion of the price is determined by certain characteristics of the animal. Current systems pay premiums for pigs with low amounts of fat and high amounts of muscle. Advanced measurement systems that will allow premiums to be paid for carcasses with better-flavored, juicier and more tender meat are being researched by producers and processors.

The **marketing chain** for pigs is made up of a wide variety of businesses that include pork producers, packers, processors, purveyors, retailers and foodservice operators. All play an important role in adding value to pigs by producing pork products that meet the needs and desires of consumers worldwide.

Prices for Pigs

No matter what marketing system is used, prices are generally determined by **supply and demand**. There have historically been few government subsidies to support producers in times of low prices. If supplies are low and/or demand is high, prices will be high. If supplies are high and/or demand is low, prices will be low.

Pig prices vary cyclically and seasonally. Cyclical price variation is caused by time lags inherent to biological production. When prices



are high, more sows are bred and more pigs are produced. But these pigs will not reach market for about a year after they are conceived. When they do, supplies increase and prices fall, thus causing a price cycle. Seasonal price variation is caused by changes in production efficiency due to weather variation and by different demand levels, such as higher demand during the fall months..

Producers can manage the prices they receive by **hedging hogs with futures or options contracts** or by forward contracting hogs with a packer. Futures and options are traded on the Chicago Mercantile Exchange (Lean Hogs and Pork Bellies contracts).



Environmental Stewardship

Pork producers are committed to managing their farms in an environmentally responsible manner in order to protect the environment and conserve the natural resources for future generations. Today's pork production operations capture, treat and recycle the valuable nutrients produced in manure so they can be used as a natural source of fertilizer.

Over the last decade, America's pork producers have played a leading role in advancing animal agriculture's environmental and conservation efforts. Producers work to address environmental challenges in a cooperative and productive fashion by partnering with government, scientists, conservationists and the communities in which they live and farm.

For instance, the pork industry's work on the environment has included helping to develop better best-management practices (BMPs) in manure containment and use, and working with the U.S. Environmental Protection Agency (EPA) to fund air-quality monitoring studies.

Most producers have implemented a nutrient management plan, which is a compilation of conservation practices and management activities developed for a specific production site that helps ensure that both production and natural-resource conservation goals are achieved. The plan incorporates practices to use animal manure as a beneficial resource for crop production.

Manure and Nutrient Management

Manure as Fertilizer

Using manure as a crop nutrient is a practice as old as agriculture itself. Applying manure to cropland benefits crops and soil. Manure helps build the organic content in soil and improve soil moisture-holding capacity, something commercial fertilizers can't accomplish.



What are lagoons and slurry storage systems?

Slurry systems are glass-lined steel, concrete or earthen structures that serve as storage for manure and wastewater from animals. The concrete structures are often built under the hog building. External tanks are sometimes covered.

Advantages of a slurry system include greater retention of manure nutrients and less total volume of manure to handle. Nutrients also exist in a more concentrated form. However, slurry storage structures may be more costly than lagoons.

Lagoon systems are larger clay- or plastic-lined earthen structures that act as digesters and as storage structures for manure. As manure enters a lagoon, the solids settle to the bottom where bacterial activity is promoted to break down many of the solids in the manure.

Lagoons have larger surface areas than slurry tanks because of the sloped sides of the earthen structure and the need to treat and store manure and waste water. Liquid manure typically is pumped from lagoons and contains lower nutrient concentrations.

Advantages of lagoon systems usually include lower construction costs and bacterial degradation of manure solids and nutrient levels. They also can provide a source of recycled water for flushing manure from barns.

Disadvantages include some loss of the nutrient nitrogen through the air, the need to periodically remove and manage nutrient-rich sludge from the bottom of the lagoon and a greater potential for generating odors associated with anaerobic degradation of manure solids.



Every living thing needs nutrients to grow. Plants require nitrogen, phosphorus, potassium and many other elements to thrive. Most of these nutrients enter the plants through soil and application of manure, which contains these nutrients. This is an important part in completing the natural nutrient cycle of agriculture: Crops feed the animals and the animal manure feeds the crops. It is a perfect example of “recycling.”

Modern pork production operations use manure storage and handling structures that safely contain manure at the production site and apply swine manure according to a nutrient management plan and in a manner that does not cause surface or groundwater pollution. Pork producers continue to develop innovative methods, such as injecting the manure into the soil, that effectively minimize odor, dramatically reduce runoff potential and increase the availability of the valuable nutrients in manure to crops and plants.

Sound manure management involves proper design, construction, maintenance and operation of on-farm manure handling systems. Sound manure management systems allow producers to:

- capture and recycle valuable nutrients
- comply with laws and regulations concerning environmental management
- enhance the environment they live in
- improve neighbor relations

Other manure treatment and handling technologies also are being used by some pork producers.

Broad use of these alternative technologies is slow because:

- the costs of implementing these technologies may be prohibitive to the majority of farms
- the expertise required for management of the technology is high

Lagoon Aeration

Aeration is a process sometimes considered in managing swine manure in lagoons or other outside storage structures. In this process, small bubbles of air are introduced into liquid manure to stimulate the growth of aerobic bacteria. These bacteria provide high-rate degradation of organic material

⁴ Air Emissions Monitoring Protocol, Steven J. Hoff PhD, PE, Professor, Department of Agricultural and Biosystems Engineering Iowa State University, 2006

What Is a Carbon Footprint?

A carbon footprint is a technical assessment, which determines the amount of emissions of certain gases resulting from a process, an activity, a business or even a person's daily life-style. There are six primary gases of interest: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), per-fluorocarbons (PFCs) and hydrofluorocarbons (HFCs). These are often referred to as greenhouse gases, or GHGs, because they are believed to contribute to a "greenhouse effect," which traps heat in our atmosphere. This

greenhouse effect has the potential for global warming, resulting in climate change on earth.

The global warming potential of each of these gases is different and to be quantified needs to be adjusted to a common unit of measure. That common unit is carbon dioxide and is expressed as a carbon dioxide equivalent (CO₂e). These emissions are generally measured in metric tons (2,204 pounds), the international standard.

Carbon dioxide, methane and nitrous oxide are the primary GHGs that result from agricultural and livestock operations. The other three gases are not generally associated with ag operations.

A carbon footprint estimates the size and breakdown of GHG emissions, identifies areas where emissions may be positively impacted by improved efficiencies and provides a mechanism to track performance in improving efficiencies and reducing emissions.

In 2008, the National Pork Board adopted a resolution regarding the pork industry's carbon footprint. The resolution established that:

- The carbon footprint of U.S. pork production is of significant importance to the pork industry and its customers.
- The industry must develop a strategy to measure its footprint and identify challenges and opportunities from which solutions that are ethically grounded, scientifically verifiable and economically sound can be implemented by America's pork producers.



What Is the Carbon Footprint of U.S. Pork Production?

America's pork producers are among the most environmentally and socially conscious food producers in the world today. From their continual emphasis on the well-being of the animals under their care to their stewardship of the soil, water and land they call home, pork producers are leaders on many environmental fronts. And as always, producers continue to ensure that the food they produce is done so in a responsible and caring way for animals, consumers and the environment.

Just as they took steps in the 1980s and '90s to protect the soil and water, today's pork producers are leaders in assessing and understanding their carbon footprint. Through the Pork Checkoff, producers are funding research efforts at the University of Arkansas' Applied Sustainability Center to measure and identify the overall carbon footprint involved with pork production. They are determined to address this important area and capitalize on opportunities that make good environmental sense and are economically sustainable.

Animal agriculture as a whole contributes a small part of U.S. Greenhouse Gas (GHG) emissions.

in the manure with less odor than is produced by anaerobic systems. However, aeration systems require significant hardware (pumps, aerators), energy inputs (usually electricity) and maintenance to keep the system operating efficiently.

Solid Separation

Separating solids from liquid manure may be beneficial in some cases. Manure solids contain a significant portion of the total manure phosphorus if separated soon after excretion. Manure solids high in phosphorus can be more fully used by transporting a nutrient-dense smaller volume to locations low in phosphorus for crop production. These solids may be composted and sold or otherwise removed from the livestock-production area. The separated liquid contains only a reduced amount of nutrients that are applied on the land.

Methane Digester

Methane generation through anaerobic digestion of manure is another management method. Manure is put into a closed container or a covered basin, where oxygen is not present. As manure is digested, methane gas is produced. This gas can be collected and burned for heat or used to generate electricity. The leftover liquid has fewer odors than the original manure. However, the cost and labor needed for digesters has slowed implementation.

Land Application

Manure contains elements required for plant growth, including nitrogen, phosphorus, potassium and micronutrients. Manure's unique combination



of these nutrients with organic carbon provides value to crop production and the environment.

Manure applied properly to the land provides many environmental benefits including: reduced soil erosion and runoff; increased soil organic content and reduced atmospheric carbon levels; reduced demands for natural gas intensive nitrogen fertilizers; reduced demand for commercial phosphorus fertilizer; and improved crop productivity.

Most producers complete a manure and nutrient management plan in which they delineate how they will recycle the valuable resources produced as manure on their farms. If the nutrients will be applied to the land as fertilizer, the plan includes regular soil testing to determine soil nutrient requirements and manure testing to determine the nutrient content of the resource.

The plan also identifies environmentally sensitive areas where application should be avoided or special precautions must be considered.

Pork production operations are effectively zero-discharge systems and pork producers understand and take seriously their responsibility to properly manage manure from their operations.

Constructed Wetlands

In a constructed wetland, liquid manure is treated aerobically (with oxygen), while aquatic

plants take up some of the nutrients in the manure. Constructed wetlands can provide a high degree of treatment to manure. So far, constructed wetlands have not been used by a lot of farmers. They require a large area of ground, are expensive to construct and establish. Vegetation requires more management after storm events due to more surface area that collects rain water and they do not work well during cold weather. Livestock producers are not allowed to release manure or wastewater into waterways, so land application is still required for water from a constructed wetland. Long-term use of wetlands with swine farms has not been well documented.

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Water Quality

Pork producers are good stewards of the environment and strive to manage their farms in ways that protect the environment. They are committed to operating their farms in a responsible manner with respect and care for precious surface- and ground-water resources.

The nutrients in swine manure, principally nitrogen and phosphorous, are naturally occurring compounds that result from various biological processes other than animal agriculture. Nitrogen and phosphorous can result from the decomposition of organic material such as leaves, plants and wildlife droppings. These nutrients are also present in other sources that contribute to the environment such as the effluent from municipal and industrial sewage plants and urban runoff primarily from lawns and pet waste.

Pork producers carefully plan and design manure management systems to protect natural resources including water. Manure storage structures can be constructed of concrete, metal or earthen materials. If earthen structures are used, they are generally lined with compacted clay or synthetic materials to ensure protection of ground water. Earthen structures used by pork operations are very similar to the earthen structures used at many municipal sewage plants with one exception – pork operations do not discharge their effluent into surface-water sources like many municipal systems do.

When swine manure is applied to the land as fertilizer, pork producers follow nutrient management plans that carefully consider the amount of nutrients already available in the soil, the nutrients that will be needed by the farm crops to be raised and the nutrients in the manure. Manure is applied only as needed to meet the nutrient requirements of the crops and in ways that reduce the potential for runoff of manure into bodies of water.

The 2004 Water Quality Assessment Database compiled by state environmental regulatory agencies and the U.S. Environmental Protection Agency (EPA) lists sources of surface-water impairments of the nation's rivers, streams and lakes. It shows that livestock agriculture ranks low as a potential source of impairment. In Iowa, the state that raises the most hogs, livestock production ranks last as the probable source of impairment for streams and rivers and is not a source of impairment for lakes,



ponds and reservoirs.¹ Pork producers take their responsibility to be good environmental stewards very seriously and work hard each day to manage their farms in ways that protect the precious water resources we all rely upon.

Reference

¹ U.S. EPA National Water Quality Assessment Data for the State of Iowa, 2004.

Odor Management

Odor can result from any livestock operation regardless of the type of animal being cared for or the size or type of operation. The perception of odor can vary depending on the location of the farm relative to human receptors, wind speed and direction, temperature, humidity and the individual sensitivity of people to odors.

Some of the compounds that cause odor from livestock operations are not unique to agriculture and are naturally occurring. For example, naturally decaying organic materials in wetlands, streams and rivers have the potential to create odor. Other types of odor-causing compounds also occur as a result of human activities and other industries.

Pork producers are aware that there is a potential for odor from their farms and use a variety of management practices to mitigate and control odors from their operations. Because odor-causing gases can attach themselves to dust particles, producers practice dust-control measures including good housekeeping inside and outside of the barns and may use vegetative windbreaks, plant buffers or fan filters to keep barn dust and odor from moving off the farm. Proper management of manure storage helps reduce odors as well. Some pork producers use natural or synthetic covers on manure storage structures to help control odor.

Land application of manure as fertilizer is another source of odor. However, it generally only occurs over a few days, once or twice each year. Producers know that the greatest opportunity to reduce manure-odor release is during the actual land-application process. For this reason, many producers have adopted technologies that allow



them to incorporate manure beneath the soil surface. Research has shown that this method of application can reduce the release of odors by more than 90 percent when compared to spreading manure on the soil surface. Data indicate that there is no difference in odor from land where manure is injected below the soil surface and land that has not been fertilized with swine manure.¹

A study conducted by the Department of Natural Resources in Iowa, the state that raises the most hogs, found that in very few cases (7 percent) did odor levels exceed the agency's benchmark threshold at pork production operations. In even fewer cases, a total of 4 percent, measurements taken near public use areas, educational and religious institutions, residences or commercial enterprises exceeded the benchmark thresholds.

When measurements were taken at land application sites, odor levels exceeded the threshold limit 11 percent of the time for surface application sites and only 6 percent in sites where manure was used to fertilize land by injection.²

Pork producers strive to reduce odors from pork production because it is the right thing to do for their neighbors and the communities they live and work in.

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¹ Swine Manure Land Application Practices to Minimize Odors, Robert Burns, Associate Professor of Ag and Biosystems Engineering, Iowa State University.

² Results of Iowa DNR Animal Feeding Operations Odor Survey, Iowa DNR Ambient Air Monitoring Group, January 2006

Air Quality and Emissions

Livestock operations, including hog farms, regardless of the type and size of the operation can be a source of other air emissions besides odor. These include dust and gases.

Because of this, pork producers use various measures to control and mitigate potential emissions from their operations. These practices include good housekeeping and dust-control measures inside and outside of hog barns, proper manure management and storage and use of natural vegetation windbreaks and filters on ventilation fans.

Dust from livestock operations is generated through animal activity, building ventilation and the movement of outside soil particles. Feed is usually the main component of dust from animal-feeding operations, but other solid particles also can be found in dust. Dust also can be generated from sources other than hog farms, including row-crop agricultural activities, gravel roads, industrial operations, construction activities and motor vehicle exhaust.

Dust from pork production operations is generally large-sized particles that do not travel far from the barns. A study conducted by researchers from the University of Saskatchewan found that air quality 600 meters downwind from barns was no different than “fresh country air” or air 2,400 meters upwind from the barn.¹

Gas emissions from livestock operations can include hydrogen sulfide and ammonia. These gases are not unique to agriculture and can be produced naturally and from human-made processes.

Some sources of hydrogen sulfide include municipal sewage plants, stagnant bodies of water, and many industries such as petroleum refineries, food-processing plants, pulp and paper operations and tanneries.²

Sources of ammonia are found in water, soil, and air and are a source of much needed nitrogen for plants and animals. Most of the ammonia in the environment comes from naturally occurring processes. The odor of ammonia is familiar to most people because ammonia is used in smelling salts and common household cleaners.³

A study of air quality surrounding pork



production operations conducted by Iowa State University’s Department of Agriculture and Biosystems Engineering looked at ammonia and hydrogen sulfide from pork production operations and their impacts on air quality at neighboring residences. The study found that emissions from the pork production operations did not affect air quality at neighboring residences outside the farm site. In fact, the study found that ammonia concentrations inside residences tended to be more concentrated than ammonia levels in the air outside or at the pork production operation’s property line. The study’s authors said evidence suggests that ammonia levels may be related more to inhabitants’ lifestyles, including smoking cigarettes, use of certain cleaning products and having indoor pets, than to the residence’s proximity to a hog farm.⁴

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² Toxicological Profile for Hydrogen Sulfide, July 2006, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry.

³ Toxicological Profile for Ammonia, September 2004, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry.

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What Is a Carbon Footprint?

A carbon footprint is a technical assessment, which determines the amount of emissions of certain gases resulting from a process, an activity, a business or even a person's daily life-style. There are six primary gases of interest: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), per-fluorocarbons (PFCs) and hydrofluorocarbons (HFCs). These are often referred to as greenhouse gases, or GHGs, because they are believed to contribute to a "greenhouse effect," which traps heat in our atmosphere. This

greenhouse effect has the potential for global warming, resulting in climate change on earth.

The global warming potential of each of these gases is different and to be quantified needs to be adjusted to a common unit of measure. That common unit is carbon dioxide and is expressed as a carbon dioxide equivalent (CO₂e). These emissions are generally measured in metric tons (2,204 pounds), the international standard.

Carbon dioxide, methane and nitrous oxide are the primary GHGs that result from agricultural and livestock operations. The other three gases are not generally associated with ag operations.

A carbon footprint estimates the size and breakdown of GHG emissions, identifies areas where emissions may be positively impacted by improved efficiencies and provides a mechanism to track performance in improving efficiencies and reducing emissions.

In 2008, the National Pork Board adopted a resolution regarding carbon footprints. The resolution established that:

- The carbon footprint of U.S. pork production is of significant importance to the pork industry and its customers.
- The industry must develop a strategy to measure its footprint and identify challenges and opportunities from which solutions that are ethically grounded, scientifically verifiable and economically sound can be implemented by America's pork producers.



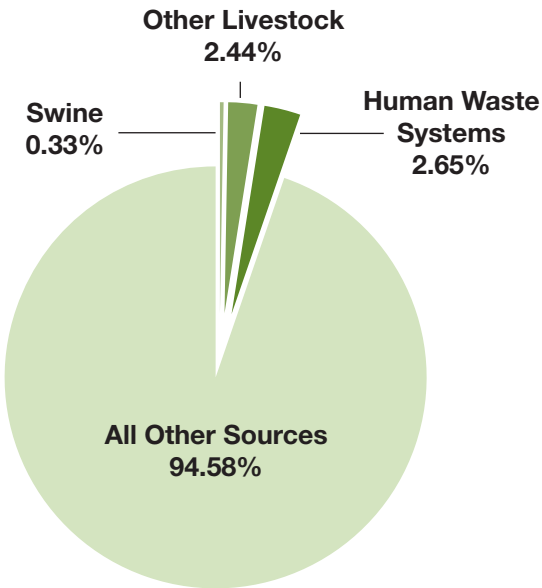
What Is the Carbon Footprint of U.S. Pork Production?

America's pork producers are among the most environmentally and socially conscious food producers in the world today. From their continual emphasis on the well-being of the animals under their care to their stewardship of the soil, water and land they call home, pork producers are leaders on many environmental fronts. And as always, producers continue to ensure that the food they produce is done so in a responsible and caring way for animals, consumers and the environment.

Just as they took steps in the 1980s and '90s to protect the soil and water, today's pork producers are leaders in assessing and understanding their carbon footprint. Through the Pork Checkoff, producers are funding research efforts at the University of Arkansas' Applied Sustainability Center to measure and identify the overall carbon footprint involved with pork production. They are determined to address this important area and capitalize on opportunities that make good environmental sense and are economically sustainable.

Animal agriculture as a whole contributes a small part of U.S. Greenhouse Gas (GHG) emissions.

U.S. Greenhouse Gas Emission Sources



Source: Data from EPA GHG Report 2007.

According to the U.S. Environmental Protection Agency (EPA), in 2007 only 2.8 percent of U.S. GHG emissions came from animal agriculture and pork production contributes even less--a mere one-third of one percent (0.33%) of total U.S. GHG emissions.¹

Unlike some other livestock species, pigs with their single stomach don't produce much expellable gas during digestion, which according to the United Nations' Framework Convention on Climate Change, is ranked as second among the top four main sources for non-CO₂ GHG emissions. The other main sources, in order, are soils, manure management and rice cultivation.

In GHG emission terms, producing pork is easier on the environment than are people. In terms of waste handling, humans generate 2.65 percent of total GHG emissions just from municipal sewage treatment plants and solid-waste landfills. Meanwhile, pigs only create 0.3 percent in total.

Reference

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Where Can GHG Emissions Come from on a Hog Farm?

Carbon emissions can come from a variety of areas of a pork operation.

Manure Storage

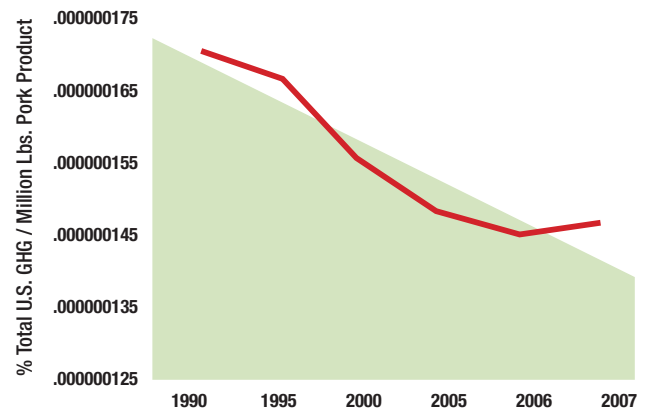
Manure lagoons represent one of the biggest opportunities to reduce greenhouse gases (GHG) emissions. The reason anaerobic lagoons are a good reduction source is that they can be a source of significant amounts of methane (CH₄). Methane has an impact potential 21 times higher than carbon dioxide (CO₂).

There may be various options for controlling emissions from manure storage and handling. One option is to cover manure storage structures and capture the emissions. The gases can then be flared or used as a fuel source to drive power generators or equipment.

Fuel Use by Facility Vehicles

Depending on the size of the facility and complexity of the facility processes, a facility's tractor and vehicle fleet can make up a sizeable portion of a pork operation's GHG emissions. Measures to reduce GHG emissions from vehicles

Percent of U.S. Greenhouse Gas Emissions Per Million Pounds of Pork



Source: Data from EPA GHG Report 2007; Pork Quick Facts, 2009.



can be as simple as putting in place rules against idling, more efficient routing or multi-purpose single trips. Focusing on tractor and vehicle efficiency also may result in significant savings.

Hog Building Energy Consumption

Reductions of GHG emissions from hog facilities can be achieved in different ways. These reductions arise from energy efficiency measures such as lighting upgrades, improved temperature regulation (heating and cooling) in buildings, upgrades on fan motors, the use of natural light and onsite fuel for power production. An additional benefit from these emission reductions is money saved from lower electricity and fuel bills.

Feed Production and Delivery

GHG emissions from feed crop production generally are the result of nitrous oxide emitted from fertilizer application and from nitrogen volatilization after application. Emissions savings in this area can be achieved primarily by increasing the use of natural fertilizer such as pig manure and through injection application of fertilizer.

These general categories can begin to give ideas for reducing GHG emissions on pork operations.

Community and Neighbors

The distinction between “country” and “city” living used to be pretty clear. However, the lines between urban and rural areas are becoming increasingly blurred. Today’s neighborhoods can include retail centers, business parks, housing developments expanding into traditionally agricultural landscapes.

U.S. pork producers realize the importance of being good neighbors and active, responsible citizens in their communities. Many of today’s pork producers, or their family members, also are teachers, coaches, community leaders, etc.

While concern is sometimes expressed about quality-of-life issues near pork production operations, communities in North Carolina have experienced rapid growth in pork production while at the same time tourism has increased. A study paid for by the Minnesota Legislature and conducted by researchers at the University of Minnesota found that new, large livestock facilities were strongly



associated with higher nearby residential property values. The study, the largest of its kind to date, looked at actual sales prices of 292 rural residential properties located near livestock facilities larger than 500 animal units (1,250 finishing pigs). The study showed a mean price increase of 6.6 percent for a rural residential property near a new feeding operation of this size or greater.⁴

Regardless of the positive impact pork production may have on a community, conflicts can arise when urban and residential areas get too close to the farm. For example, residents downwind from production operations may be offended by odor, or by the noise from equipment such as tractors, grain dryers and trucks. Other common complaints involve dust and slow-moving farm equipment on roadways.

Research funded by the pork industry continually sheds more light on how to control some of the noise, odor and dust associated with agriculture, and particularly pork production. Producers use this new information to reduce the impact of their farming operations on surrounding areas. Novel ventilation strategies that mitigate dust exhaust from production barns and manure storage systems that reduce odor are just some examples of the projects producers put in practice to reduce the

impact of their operations on the community in which they work and live.

Pork producers of all sizes and types are dedicated to raising high-quality, safe food in an environmentally friendly and socially responsible manner. They also know it's important to cultivate understanding, open lines of communication and good relationships with neighbors and the communities in which they have decided to work, raise a family and live.

Environmental Stewards

A strong commitment to the environment and to the communities that surround their operations characterize the Pork Industry Environmental Stewards program. The pork producers selected to receive these awards demonstrate that environmental responsibility is not just the right thing to do, but also plays a fundamental role in how they run their businesses.

The awards are presented annually by the Pork Checkoff and partner and cosponsor, the *National Hog Farmer* magazine. Candidates for the annual environmental steward awards apply or can be nominated for the honor and represent all sizes and types of operations. A committee of producers evaluates and selects the winners based on:

- **Manure management**
- **Soil and water conservation practices**
- **Air quality management**
- **Wildlife preservation**
- **Farm aesthetics and neighbor relations**
- **Innovation**
- **An essay on the meaning of environmental stewardship**

While environmental responsibility is one of the hallmarks of responsible U.S. pork producers, these operations have opened the doors of their operations to share their story. The result is one example of how pork producers' seemingly routine and daily practices are, in reality, a display of their dedication to the sustainability of the industry, of their communities and of the world.

For more about the Environmental Steward program, go to pork.org.

Public Health

U.S. pork producers are committed to ensure their practices protect public health. As such, they:

- Use management practices consistent with producing safe food.
- Manage the use of animal health products to protect public health.
- Manage manure and air quality to protect public health.

Antibiotic Resistance

Antimicrobial (antibiotic) use in livestock agriculture is an issue that has received increased attention in recent years.

Producers, veterinarians, and other food-chain participants share the concerns regarding the use of antibiotics as tools utilized in the production of our food supply. The responsible use of these products is beneficial both for the health and welfare of the animal and for food safety and human health. It is important to use antibiotics responsibly to minimize the development of antibiotic resistance, preserve their effectiveness and to maintain availability of these products. Antibiotics, and other animal health products, while important tools for good animal health management, are only one component in a comprehensive herd health program. Antibiotics are not used to replace good management, but rather as a supplement to management when appropriate.

Pork producers use antibiotics for three purposes: treatment of illness, prevention of disease, and to improve the nutritional efficiency of their animals.

- **Treatment of Illness** – The use of antibiotics in animals to combat a clinical illness. Antibiotics used for treatment are delivered by injection, in feed or in water.
- **Prevention of Disease** – The use of antibiotics in animals that have been, or are being, exposed to a bacterial infection, or are in operations that have historically experienced clinical outbreaks of disease at certain production stages.



Antibiotics for prevention are typically delivered in feed or water.

- **Improve Nutritional Efficiency** – Antibiotics used to enhance the efficiency of pigs in converting feed. Antibiotics used to enhance nutritional efficiency are typically delivered in feed.

Producers and their veterinarians use their experience and knowledge, in combination with scientific information, to decide when to use antibiotics in their pigs. The use of animal health products, including antibiotics, is only one part of a comprehensive herd health program. Biosecurity, diagnostics, vaccination, facility maintenance and animal care also contribute to a farm's overall animal health picture.

The appropriate use of antibiotics does not impact food safety negatively. There are animal health and societal benefits to using antibiotics to increase nutritional efficiency. Experience in Europe, where the political decision was made to ban the use of antibiotics to improve nutritional efficiency, shows that there are disease prevention benefits to using low levels of antibiotics. The ban was put in place in 1998 and there has been no demonstrated human health benefits from it.¹ In addition, animals that convert feed efficiently consume less feed and produce less waste. That means

more corn available for human food and for the production of renewable fuels and less manure for the producer to manage.

Antibiotics for use in animals are regulated by the U.S. Food and Drug Administration (FDA). The FDA approves the use of antibiotics only after they undergo a vigorous review for safety to animals, humans and the environment. This ensures that food products from animals treated with antibiotics are safe. Additionally, the FDA has mandated that food or milk from animals that have been treated with an antibiotic may not enter the food supply until a predetermined amount of time has elapsed since the animal's last dosage. Samples of meat and milk are tested to ensure adherence to the withdrawal regulations. This process ensures the safety of our products.

It is a common misperception that only large producers use antibiotics. A 2000 survey conducted by the U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) determined that the use of antibiotics in animal feeds was not related to the size of operation. In fact, a similar percentage of small producers and large producers report using antibiotics.²

The extent to which antibiotic use in animals affects human health is difficult to impossible to determine due to a lack of scientifically definitive

ways to measure it. However, one panel of experts estimates that 96 percent of antibiotic resistance in humans is due to human use of antibiotics and not because of antibiotic use in animals.³

According to the Institute of Food Technologists, the estimated risk to human health from certain antibiotics used in food animal production is low. The institute also reports that the benefits of using antibiotics may very well outweigh the risk.⁴

Even though resistance problems in humans are largely not attributable to antibiotic use in pork production, pork producers recognize the need to do their share to minimize risks of antibiotic resistance. Producers are committed to protecting public health and preserving animal health and well-being by using antibiotics responsibly as outlined in the Pork Checkoff's **Pork Quality Assurance; Plus program** and the Take Care – Use Antibiotics Responsibly™ program.

The basis for using antibiotics responsibly during pork production involves evaluating their use to protect animal health, optimize effectiveness and minimize the risk of developing antibiotic resistance, thereby protecting animal health. In the Checkoff's programs, **producers are committed to the following principles and guidelines to ensure the responsible use of antibiotics.**

- Take appropriate steps to decrease the need for the application of antibiotics.
- Assess the advantages and disadvantages of all uses of antibiotics.
- Use antibiotics only when they provide measurable benefits.
- Use professional veterinary input as the basis for all antibiotic decision-making.
- Use antibiotics for treatment only when there is an appropriate clinical diagnosis.
- Limit antibiotic treatment to ill or at-risk animals, treating the fewest animals indicated.
- Use antibiotics that are important in treating antibiotic-resistant infections in human or veterinary medicine in animals only after careful review and reasonable justification.
- Minimize environmental exposure through proper handling and disposal of all animal health products, including antibiotics.

Producers understand that it is essential to public



health and food safety, animal health and well-being, and the environment to maintain the effectiveness and availability of antimicrobials.

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Zoonotic Diseases

Pork producers and public health officials understand the importance of paying attention to zoonotic diseases – those diseases that can be transmitted between humans and animals. Zoonotic diseases can be caused by bacteria, viruses, parasites or fungi.

The most common zoonotic diseases humans acquire from animals are foodborne, but zoonotic diseases can also be transmitted through close contact with animals or animal wastes. Considering how many of us have close daily contact with our pets or other animals, the overall number of zoonotic infections is fairly low.

As an example, in China there were over 200 cases of the swine pathogen *Streptococcus suis* (*S. suis*) in humans in 2005. However, these cases have been blamed on the high degree of exposure of humans to the carcasses or unprocessed pig meat of sick animals. The close daily contact between backyard farmers and their animals also is suspected. It is believed that the bacteria enter the human through a break in the skin, the respiratory or gastrointestinal tracts.¹ In the United States, where federal inspection of animals in packing and processing facilities keeps sick animals out of the food supply and where pork producers utilize modern production practices and biosecurity protocols in raising pork, there has only been one reported human case of *S. suis* since 1968.

Another zoonotic disease of interest is influenza.



While influenza originates in birds, humans and other animals also can contract certain types of influenza. Pork producers routinely work to prevent influenza in their pigs and their workers by birdproofing buildings, practicing good hygiene and biosecurity, vaccinating their pigs and encouraging their workers to get vaccinated.² The U.S. pork industry has collaborated with USDA and the Centers for Disease Control and Prevention (CDC) to develop surveillance systems for influenza that are designed with public health and animal health goals.

Controlling the presence of pathogens on a livestock farm is important for the health and performance of the animals and to minimize the risk to human health. Raising pigs indoors helps to reduce the animals' exposure to pathogens carried by rodents, wild animals or birds. Pork producers use the following four basic approaches to control pathogens on their farms:

- Minimizing the risk of introducing bacteria, viruses or parasites onto the farm by employ-

ing strict biosecurity measures. Biosecurity measures also prevent visitors or workers from carrying pathogens off the farm.

- Breaking the cycle of infection once the presence of pathogens has been identified on the farm.
- Handling and treating manure appropriately to minimize the spread of pathogens.
- Preventing pathogens from being exported off the farm.

Preventing Transmission of Disease from Animals to People

While pork producers practice biosecurity and other measures to prevent and control disease on their farms, the CDC offers practical advice for people who have contact with animals:

- Washing hands after visiting a farm or handling animals.
- Proper handling and cooking of food.
- Proper siting and maintenance of water wells.
- Disinfecting drinking water when camping.
- Washing hands before eating.
- Keeping animals healthy.

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Methicillin-Resistant *Staphylococcus Aureus* (MRSA)

In the past several years, methicillin-resistant *Staphylococcus aureus* (MRSA) has received increased media attention. The bacterium was associated primarily with post-surgical infections or infections acquired after prolonged stays in health care facilities (such as nursing homes) or in people with weakened immune systems.

More attention was called to the pathogen when



media began to report on infections acquired outside of health-care facilities. These community-acquired infections happened in locker rooms, gyms, military facilities, prisons and day-care facilities, among other places. These reports heightened concerns because the people affected were not considered to have weakened immune systems or other underlying conditions that would predispose them to infection.

Companion animals including cats, dogs and horses have been found to carry MRSA. Studies have found that veterinarians and others in close contact with these animals also may carry the bacterium¹.

In late 2007, attention was called to the pork industry and its products when the media reported on a study by Canadian researchers that found MRSA on pig farms². MRSA had previously been reported in pigs and pork products in Holland in 2006³. Since then, research conducted in the United States also has found MRSA in pigs on some farms and in a small proportion of pork products. MRSA also has been reported in pork producers and veterinarians who visit pig farms.

MRSA, People and Pigs

MRSA is a type of *Staphylococcus aureus* (Staph). Staph are bacteria found commonly in humans. In fact, the Centers for Disease Control and Prevention (CDC) report that Staph can be found in 25 to 50 percent of the United States' population at any given time without causing infection⁴.

MRSA however, can only be found on between 1 to 3.5 percent of the U.S. population. As with Staph, a person usually carries MRSA in the nasal passages or on the skin without developing an infection.

MRSA also can be found on other animals, domestic and wild. Domestic animals such as cats, horses and dogs can carry the bacterium. Livestock, including cattle and pigs, and poultry also may carry MRSA. Wild animals (such as marine mammals, rabbits and turtles) and game animals also have been found to carry it.

Just as MRSA is a type of Staph, there are many types of MRSA. Some have been associated more commonly with health-care associated infections, some with community-acquired infections and some are more commonly associated with animals. The CDC has stated that the MRSA more commonly associated with health-care facilities is different than the one commonly found in community-acquired infections. It also has stated that the MRSA associated with community-acquired infections is clearly of human origin.

The MRSA most commonly found in pigs on North American farms is different from the one associated with health-care and community

infections. As is the case with small animal veterinarians and horse owners, it is not unusual for the people who come in contact with MRSA-carrying pigs to also carry MRSA. In many of those cases, the MRSA carried by people and by the pigs is of the same type. The bacteria do not appear to cause illness in the pigs and there are no data to support that the humans carrying this pathogen are at a higher risk of developing infection than the rest of the population.

Similarly, recent studies of health-care workers in Holland have found no statistical difference in the number that carry MRSA and have contact with livestock and those with no animal contact⁵.

MRSA and Pork

Several independent studies, abroad and in North America, have found MRSA in samples of meat offered for retail sale⁶. The bacterium has been found in samples of beef, veal, chicken, turkey, lamb, pork and game meats.

The European Union food safety and health agencies issued a joint scientific report on MRSA in livestock. They concluded that there is currently no evidence for increased risk of human colonization or infection following contact or consumption of food contaminated by MRSA both in the community and in a hospital.⁷

Furthermore, experiments designed to find MRSA in retail meats have found very small amounts of MRSA in the samples. It is not clear if the amount found would be enough to cause infection and no human infection has ever been reported from handling or consuming pork carrying MRSA. Dutch studies have determined that, "The numbers of MRSA bacteria found on foodstuffs are so low that the risk of [human] colonization as a result is considered to be particularly slight."⁸

It is commonly accepted that conventional, safe handling and cooking practices reduce the risk of MRSA infection even further. In a report commissioned by the U.S. House Committee on Agriculture, the CDC states that, "it is reasonable to conclude that the vast majority of infections result from person-to-person contact."⁹ The CDC also has stated that "although the finding of MRSA in



retail meats suggests a possible role for foodborne transmission, if such transmission occurs, it likely accounts for a very small proportion of human infections in the United States.”

Recommended guidelines¹⁰ for the handling of meat that reduce the potential for any type of foodborne illness are:

- Clean
- Separate
- Cook
- Chill

Hand washing before handling food products and between different products to avoid cross contamination also is important.

Proper wound care, including prompt treatment and covering of wounds should always be done and especially if food is to be handled.

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Community Respiratory Health

Preserving the health of those employed in pork production, as well as that of the people living in communities hosting pork production is a priority for pork producers.

People who work in close contact and for long hours with pigs may have an increase in respiratory symptoms such as sneezing, sinusitis or bronchitis. Pork producers routinely provide personal protective equipment to their workers to help alleviate these symptoms. These concerns are not considered relevant to neighbors because the level of exposure that pork producers and their employees have to their work environment is much higher than the one neighbors experience.¹ Research that includes medical testing on neighbors in the United States has not been published. However, a systematic review of North American and European studies did not find consistent evidence for a strong association between community health and proximity to animal feeding operations.

There are several studies on the levels of emissions that neighbors of pork producers may experience. In 2002, the Missouri Department of Health and Senior Services (DHSS) and the Agency for Toxic Substances and Disease Registry (ATSDR) conducted an exposure investigation to assess the community's level of exposure to airborne ammonia from a swine concentrated animal feeding operation (CAFO) in northern Missouri. The site was permitted to house 123,648 hogs.

Air monitoring conducted during this study did not find airborne ammonia exposures from the farm occurring at a level expected to cause negative health

effects in the community. Furthermore, it does not appear that residential indoor ammonia levels were significantly increased by outdoor concentrations. The study classified airborne ammonia exposures as “no apparent public health hazard”.²

Additional research conducted by Iowa State University’s Department of Agriculture and Biosystems Engineering demonstrated that lifestyles of a residence’s occupants, such as the use of cleaning supplies, having household pets or smoking cigarettes, may contribute more to the levels of ammonia in that residence than its proximity to a swine facility.³

Asthma is a respiratory illness that is on the rise in urban and rural areas. As is well known, there are many factors that are associated with the development of asthma. These include family history; exposure to smoking; early childhood respiratory infections and other exposures. However, scientific studies have disagreed on the potential contribution of farm emissions to the development of asthma. In fact, studies within the same state found that asthma decreased when the number of farms increased near schools⁴, while another study found a slight increase in self-reported asthma when children attended schools where odor from swine operations was reported inside the schools more than twice a month⁵. However, even that study found that there was less asthma reported when the level of exposure to CAFOs near the school was ranked as high, rather than low.

While more research is needed to understand the relationship between pork production operations

and the respiratory health of their neighbors, pork producers make every effort to reduce any detrimental impact on the quality of life in their communities. By reducing their impact on air quality and taking preventive management measures to reduce gas emissions, pork producers are doing their part to improve public health at the local level.

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Pork Safety

U.S. pork producers recognize their obligation to build and maintain the trust of customers and the public in their products. To achieve this, producers:

- Use management practices consistent with producing safe food.
- Manage the health of the herd to produce safe food.
- Manage technology to produce safe food.

Their primary goal is to provide an abundant, safe, and wholesome food supply to consumers, as outlined in the industry's We Care initiative. Modern production systems and practices are designed to help accomplish that goal, together with Pork Checkoff programs, such as Pork Quality Assurance® Plus.

Modern production practices have virtually eliminated some former common causes of human foodborne illness. Pathogens, such as *Trichinella spiralis*, formerly one of the most prominent pathogens, have largely disappeared with the movement of pigs to indoor production.

The changing face of the industry has led some to believe that modern and large pork producers contribute to foodborne illness more than the traditional operations of the past. However, recent studies (2008) have shown that exposure to *Salmonella*, *Toxoplasma* and *Trichinella* in pigs raised outdoors and in antibiotic-free systems were higher than in pigs raised in indoor production systems.

Additionally, according to the USDA (2006), bacterial contamination of pork carcasses in packing plants is consistently lowest in large packing plants, which, due to the large volume of production, are most likely to acquire animals from large producers.

Residues and our Trade Partners

Never in the history of the pork industry has pork been as safe as it is today. However, the standards used to set market requirements for pork around the world may vary. As major exporters of pork around



the globe, U.S. pork producers work diligently to understand and satisfy product requirements for diverse customers.

One example of a market requirement is the establishment of maximum residue limits (MRLs) of chemicals, including animal health products in pork. The Pork Checkoff, working with the American Association of Swine Veterinarians and animal health companies has compiled a list of animal health products and their withdrawal times to serve as a guideline for pork producers and veterinarians when administering medications to animals that will enter the food supply.

More information on international MRLs is available online at pork.org.



Pork Stats

For America's pork producers, 2008 and 2009 were among the most difficult years ever. In fact, the combined losses incurred by producers in 2008 and 2009 exceeded the previously worst two-year period on record, 1998-1999. By the end of 2009, U.S. pork producers had lost money in 24 of the past 26 months, amounting to nearly \$6 billion. The top graph below shows monthly profit/loss estimates.

Profitability returned for U.S. hog producers in March 2010, and, on average, producers enjoyed healthy returns

from April through September. But even the third-largest corn crop on record was not enough to keep feed prices from rising sharply in late summer and fall, bringing financial losses to hog producers once again.

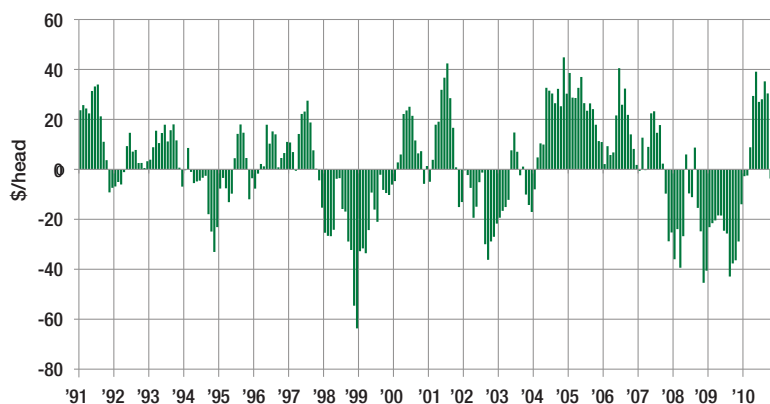
Since feed comprises anywhere from 55 to 60 percent of the total cost of producing a market pig, higher feed costs mean higher production costs and, unless pig prices rise commensurately, losses for pork producers.

The bottom chart shows the price of No. 2 yellow corn and cost of production estimates. These two data series

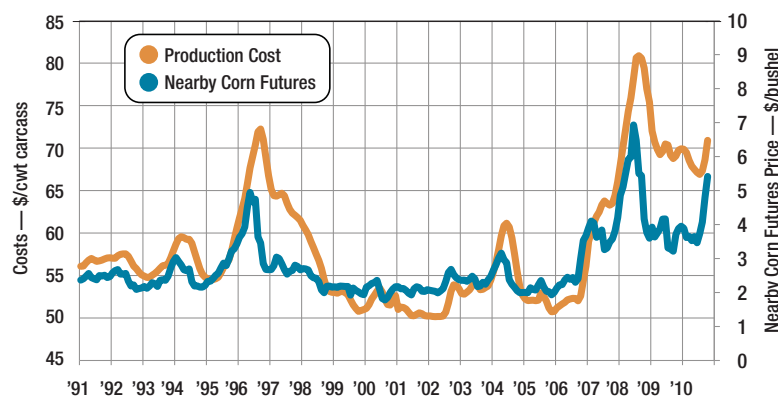
clearly are highly correlated. Higher corn prices cause the price of soybean meal, the other major ingredient in hog diets, to rise as well due to corn and soybeans competing for a limited number of tillable acres. Hog production costs averaged \$52.76/cwt., carcass weight, for 1999 through 2006, \$69.56/cwt. for 2007 through 2009 and \$72.24/cwt. for January through November of 2010. Corn and soybean meal futures prices in early January of 2011 indicated that costs will average over \$81/cwt. through the end of 2011.

Producers were able to recapture only about one-fourth of the losses they incurred from 2007 through early 2010 during the short period of profit in mid-2010. Hog producers' financial positions remain weak as we enter 2011 and further reductions of output are certainly not out of the question.

Profits/Losses — Iowa Farrow-to-Finish Hog Operations



Farrow-to-Finish Production Cost & Nearby Corn Futures



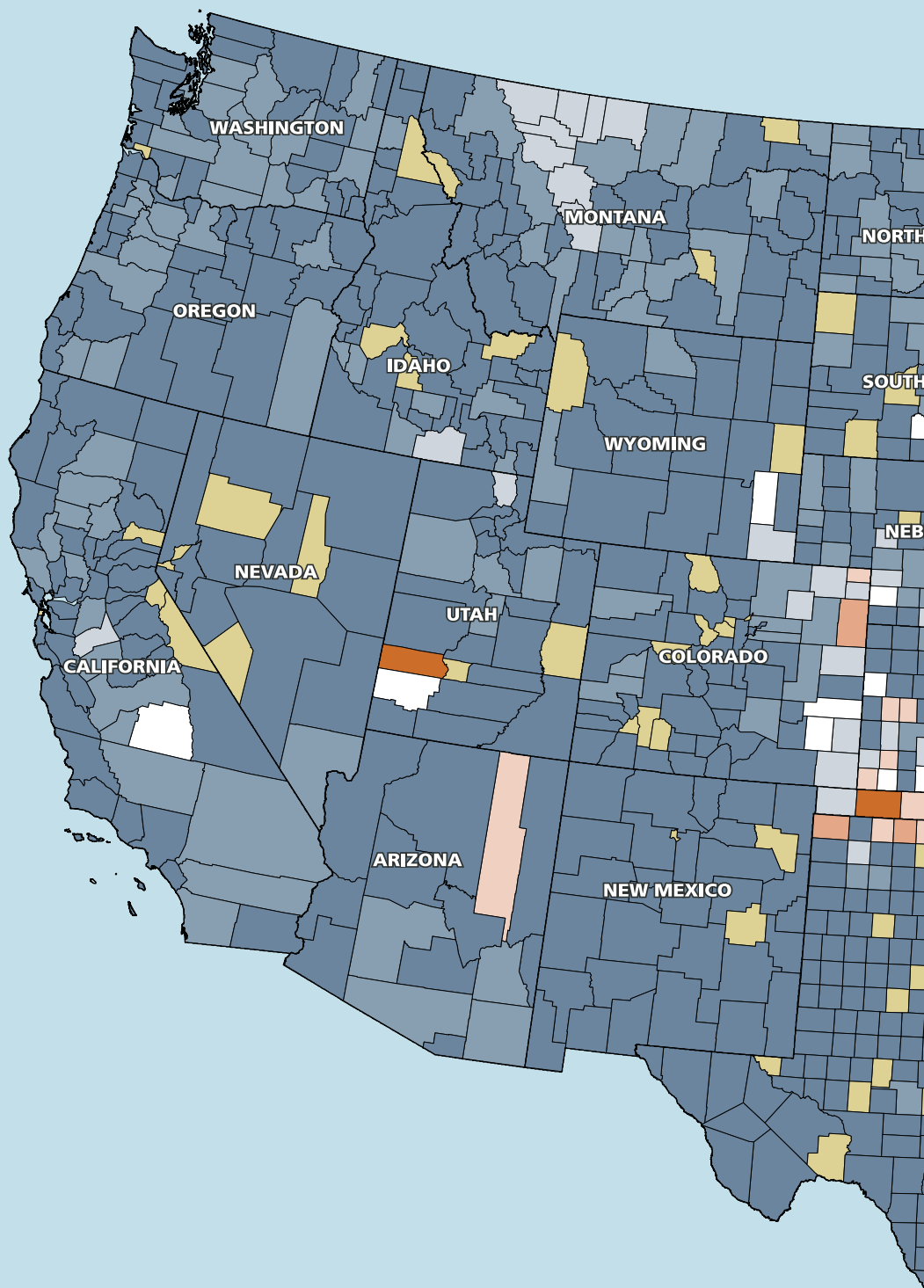
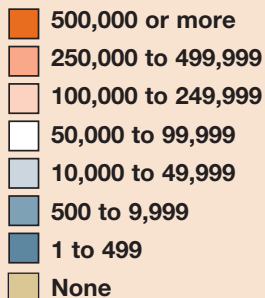
Source: Iowa State University Department of Economics and USA Agricultural Marketing Service



Steve Meyer,
president of Paragon
Economics and a Pork
Checkoff consultant,
helped compile the
information in the
Pork Stats section.

U.S. Pig Production Density, 2007*

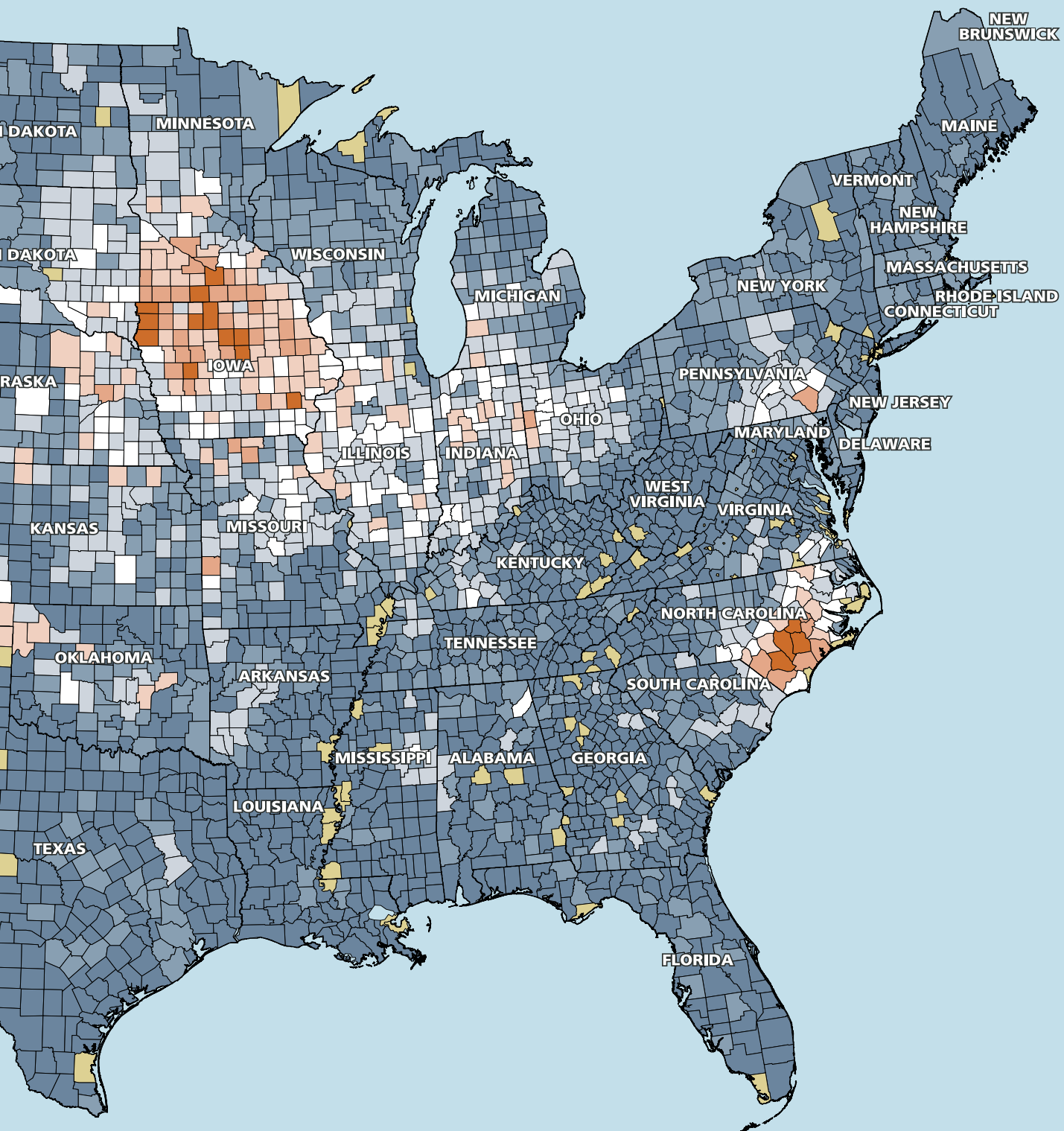
Numbers Sold:



Source: U.S.D.A. 2007
Census of Agriculture

*U.S.D.A. Census of Agriculture
is completed every five years.

Map provided by *National Hog
Farmer* magazine



America's Top 100 Pig Counties – 2007*

Rank	State	County	Inventory
1	North Carolina	Duplin	2,285,224
2	North Carolina	Sampson	2,156,254
3	Oklahoma	Texas	1,145,999
4	Iowa	Sioux	1,094,268
5	Iowa	Hardin	875,386
6	North Carolina	Bladen	811,876
7	Iowa	Plymouth	765,318
8	Iowa	Kossuth	747,370
9	Minnesota	Martin	692,093
10	Iowa	Franklin	599,768
11	Iowa	Washington	593,631
12	Iowa	Wright	576,113
13	Iowa	Lyon	561,045
14	Minnesota	Blue Earth	537,657
15	North Carolina	Wayne	533,997
16	Iowa	Carroll	529,108
17	Iowa	Palo Alto	528,486
18	Iowa	O'Brien	477,181
19	Iowa	Sac	474,104
20	Iowa	Hamilton	466,691
21	Iowa	Osceola	451,961
22	Iowa	Buena Vista	445,321
23	Minnesota	Nobles	416,370
24	North Carolina	Greene	411,971
25	North Carolina	Lenoir	357,268
26	Pennsylvania	Lancaster	355,023
27	North Carolina	Robeson	350,775
28	Nebraska	Platte	349,992
29	Missouri	Sullivan	348,167
30	Iowa	Crawford	345,434
31	Iowa	Butler	340,877
32	Missouri	Vernon	338,569
33	Iowa	Delaware	337,066
34	Minnesota	Nicollet	309,046
35	Iowa	Calhoun	306,224
36	Minnesota	Mower	305,181
37	Minnesota	Pipestone	303,680
38	Minnesota	Rock	303,090
39	Minnesota	Waseca	292,091
40	Iowa	Hancock	285,163
41	Iowa	Audubon	281,883
42	Minnesota	Jackson	278,656
43	North Carolina	Onslow	277,894
44	Iowa	Mitchell	275,550
45	Ohio	Mercer	273,762
46	Iowa	Buchanan	271,198
47	Iowa	Mahaska	264,176
48	North Carolina	Columbus	263,048
49	Minnesota	Renville	261,807
50	Minnesota	Faribault	260,536

Rank	State	County	Inventory
51	Minnesota	Freeborn	260,274
52	Iowa	Fayette	255,138
53	North Carolina	Pender	254,180
54	Minnesota	Brown	251,718
55	Iowa	Cherokee	246,170
56	Iowa	Grundy	232,942
57	Minnesota	Cottonwood	229,655
58	Minnesota	Redwood	229,045
59	North Carolina	Pitt	228,665
60	Iowa	Jasper	228,492
61	Indiana	Carroll	225,587
62	Illinois	De Kalb	225,397
63	Ohio	Darke	225,171
64	Iowa	Howard	224,101
65	Illinois	Clinton	222,241
66	Iowa	Pocahontas	222,118
67	Iowa	Chickasaw	219,213
68	Minnesota	Watonswan	217,641
69	Iowa	Clay	215,294
70	Nebraska	Boone	207,756
71	North Carolina	Johnston	205,995
72	North Carolina	Jones	201,120
73	Iowa	Dubuque	199,665
74	Minnesota	Lyon	196,834
75	Michigan	Allegan	195,695
76	Kansas	Scott	190,559
77	Nebraska	Cuming	189,750
78	Iowa	Keokuk	187,682
79	Indiana	White	186,106
80	Iowa	Clayton	182,309
81	Indiana	Decatur	179,324
82	Iowa	Johnson	177,012
83	North Carolina	Edgecombe	172,067
84	Minnesota	Dodge	171,807
85	Illinois	Livingston	170,473
86	Illinois	Henry	167,932
87	Illinois	Hancock	166,252
88	Minnesota	Stevens	164,448
89	Minnesota	Murray	164,323
90	Iowa	Webster	163,750
91	Iowa	Emmet	163,749
92	Nebraska	Antelope	163,269
93	Iowa	Cedar	160,784
94	Minnesota	Yellow Medicine	157,790
95	Iowa	Floyd	157,739
96	Nebraska	Holt	157,473
97	Nebraska	Clay	156,213
98	Michigan	Cass	156,205
99	North Carolina	Northhampton	153,834
100	Indiana	Adams	152,980

Source: USDA, 2007 Census of Agriculture

* Latest data available

State Rankings by Inventory – 2010

	State	Production ¹ (1,000 lbs.)	Marketings ² (1,000 lbs.)	Value of Production ³ (\$1,000)	Marketings ⁴ (1,000 head)	Inventory on Dec 1, 2009 (1,000 head)	Cash Receipts ^{3, 4} (\$1,000)
1	Iowa	9,623,124	10,339,702	3,585,441	40,476	19,200	4,427,373
2	North Carolina	4,099,445	4,151,504	1,836,124	19,171	9,600	1,877,798
3	Minnesota	3,426,675	3,720,325	1,420,587	16,563	7,300	1,661,343
4	Illinois	1,840,656	1,875,824	908,335	10,276	4,300	951,831
5	Indiana	1,730,277	1,798,910	724,077	7,633	3,650	834,021
6	Missouri	1,697,108	1,752,581	675,320	8,874	3,100	766,564
7	Nebraska	1,368,535	1,411,677	629,840	7,742	3,100	656,779
8	Oklahoma	1,265,851	1,315,666	473,680	7,391	2,300	511,301
9	Ohio	997,333	1,020,960	391,012	3,873	2,010	414,992
10	Kansas	915,237	945,505	326,925	3,628	1,810	364,859
11	Pennsylvania	408,916	415,282	159,393	1,769	1,160	170,086
12	South Dakota	675,571	727,222	295,942	4,062	1,160	337,467
13	Michigan	606,574	611,350	223,320	2,206	1,080	229,612
14	Texas	303,688	341,515	115,156	1,763	770	129,461
15	Utah	324,647	326,550	154,114	1,556	730	155,111
16	Colorado	268,688	280,771	129,681	2,684	710	137,645
17	Mississippi	179,790	180,305	69,416	723	365	69,804
18	Virginia	110,882	111,205	48,725	470	365	49,701
19	Wisconsin	188,766	190,727	90,422	863	360	93,833
20	Kentucky	173,505	181,620	66,522	755	350	72,491
21	South Carolina	49,908	54,270	22,035	293	225	24,706
22	Arkansas	109,779	129,037	75,542	1,695	200	85,382
23	Georgia	89,957	102,929	43,588	791	195	52,247
24	Tennessee	92,354	98,465	36,343	402	185	39,489
25	Montana	78,601	80,750	33,794	421	175	36,502
26	Arizona	76,521	75,660	38,575	292	167	38,360
27	North Dakota	60,908	69,228	39,733	797	155	43,845
28	Alabama	69,863	78,783	30,467	400	140	35,322
29	California	53,886	56,880	18,979	253	100	24,771
30	Wyoming	122,787	123,484	50,231	583	87	50,741
31	New York	25,347	27,992	8,708	161	77	9,901
32	Idaho	25,984	25,660	10,366	93	36	10,656
33	Maryland	15,250	16,109	6,079	94	30	7,067
34	Washington	11,453	11,585	4,377	56	23	4,629
35	Florida	7,879	8,240	2,927	58	20	3,118
36	Oregon	9,484	9,435	4,239	39	17	4,217
37	Hawaii	3,319	3,096	3,212	15	13	2,996
38	Massachusetts	1,813	1,608	666	10	11	631
39	Louisiana	2,757	2,869	976	15	10	1,024
40	New Jersey	1,814	2,520	426	27	8	832
41	Delaware	4,241	4,683	1,793	39	8	2,106
42	West Virginia	2,263	1,786	982	9	5	781
43	Maine	2,135	1,633	857	9	5	698
44	Vermont	1,285	1,087	501	5	3	427
45	Connecticut	831	746	321	4	3	292
46	Nevada	2,650	2,744	1,001	12	3	1,066
47	New Hampshire	1,235	1,349	388	6	2	528
48	Rhode Island	452	392	176	3	2	154
49	New Mexico	780	524	267	3	2	186
50	Alaska	604	409	547	2	1	368
	US	31,131,408	32,693,154	12,762,128	149,065	65,327	14,395,114

1 Adjustments made for changes in inventory and for inshipments.

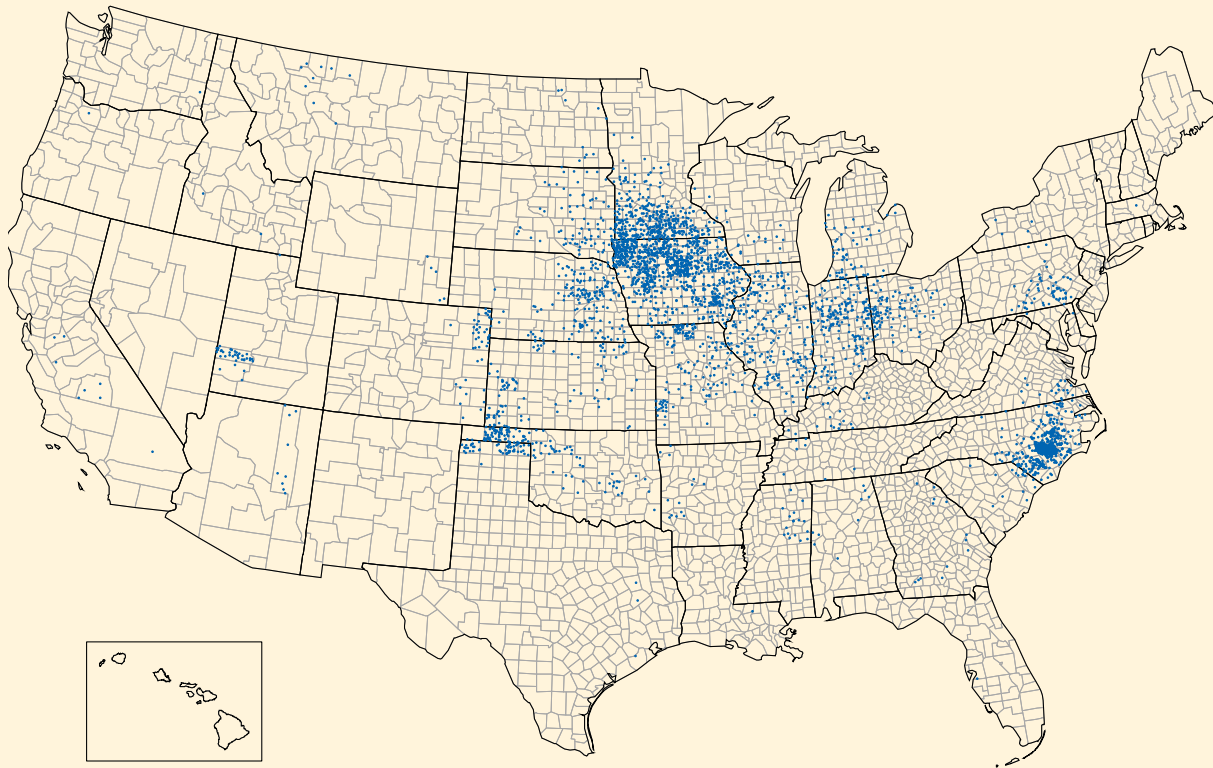
2 Excludes custom slaughter for use on farms where produced and interfarm sales within the state.

3 Includes allowance for higher average price of state inshipment and outshipments of feeder pigs.

4 Includes custom slaughter for use on farms where produced and state outshipments, but excludes interfarm sales within the state.

Source: Meat Animal Production, Disposition and Income, USDA, NASS, April 2010

Hogs & Pigs – Inventory: 2007



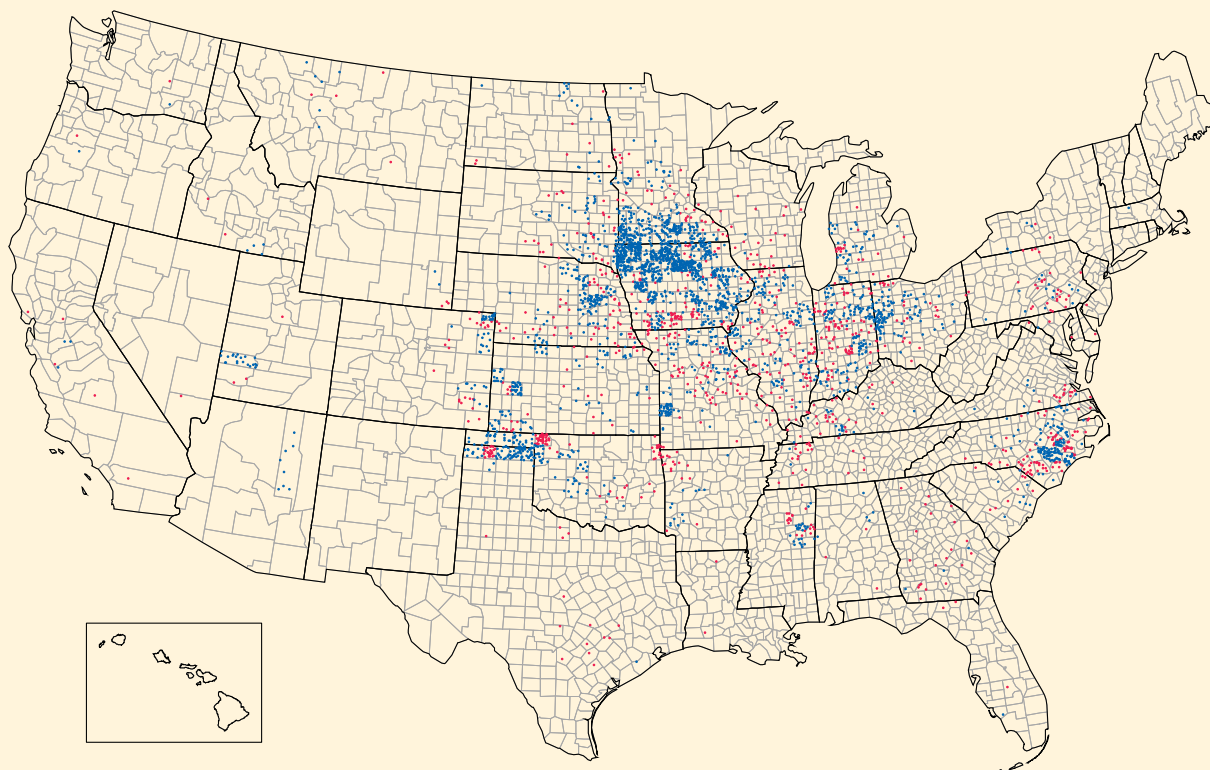
1 dot = 20,000 hogs and pigs

U.S. total = 67,786,318

The vast majority of hogs and pigs in the United States reside in the upper Midwest or Corn Belt states. Since 1990, though, significant pork production has developed in North Carolina, the Oklahoma-Texas Panhandle region and Utah.

Source: USDA, 2007 Census of Agriculture,
U.S. Department of Agriculture, National Agricultural Statistics Service

Hogs & Pigs – Change in Inventory: 2002 to 2007



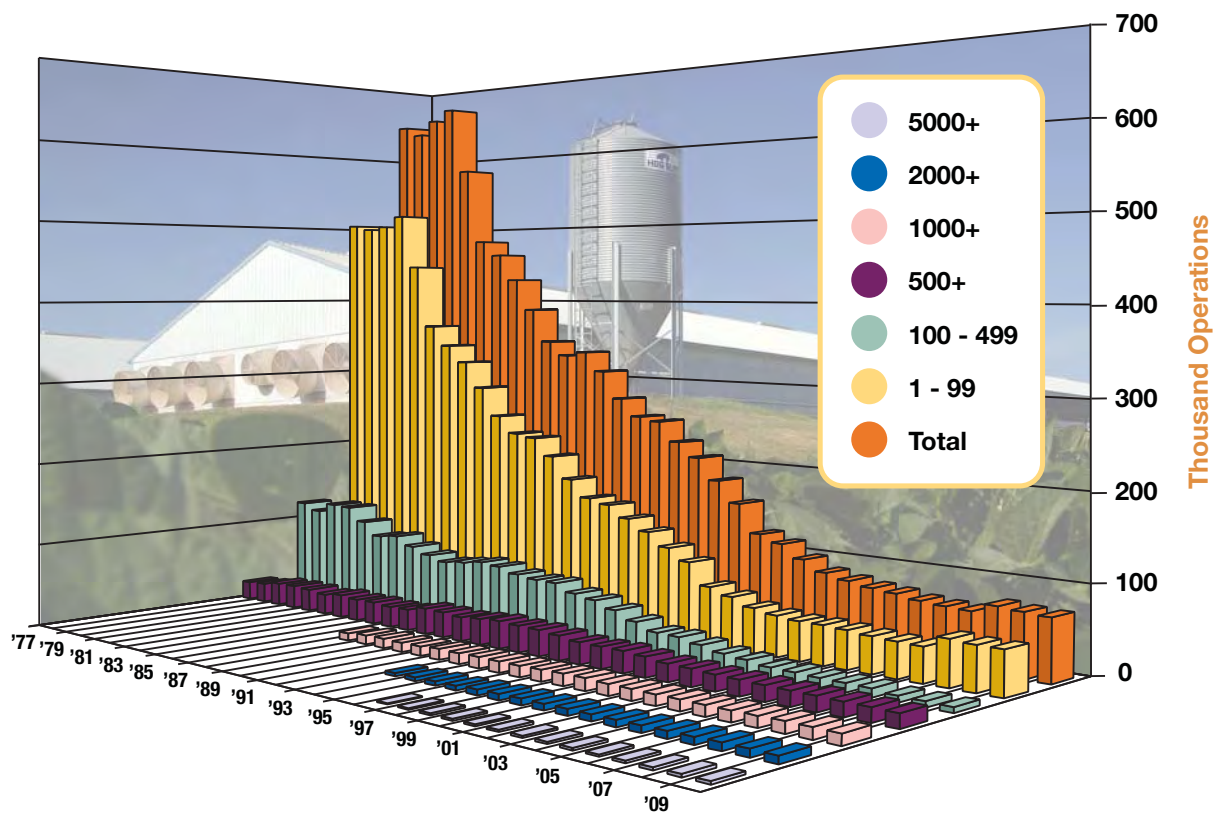
1 dot = increase of 5,000 hogs and pigs
1 dot = decrease of 5,000 Hogs and Pigs

United States Net Increase + 7,381,215

Since 1997, U.S. hog inventories have moved from “fringe” Corn Belt areas and the southeast states and have become even more concentrated in Iowa, Minnesota, the high plains of Oklahoma, Texas, Kansas, Colorado and Utah. Most of these areas are close to packing plants and have ample grain supplies.

Source: USDA, 2007 Census of Agriculture,
 U.S. Department of Agriculture, National Agricultural Statistics Service

Number of U.S. Hog Operations by Inventory Size



- Categories for 500 head or more are cumulative (i.e., the 500+ column includes the 1,000+ column, which includes the 2,000+ etc.)
- An operation is any farm that has one or more hogs or pigs on hand at any time during the year.

Sources: USDA, Hogs and Pigs Report (December 1977-2002)
Livestock Operations (April 2004)
Farms, Land in Farms and Livestock Operations (2005-2010)

Number of U.S. Hog Operations

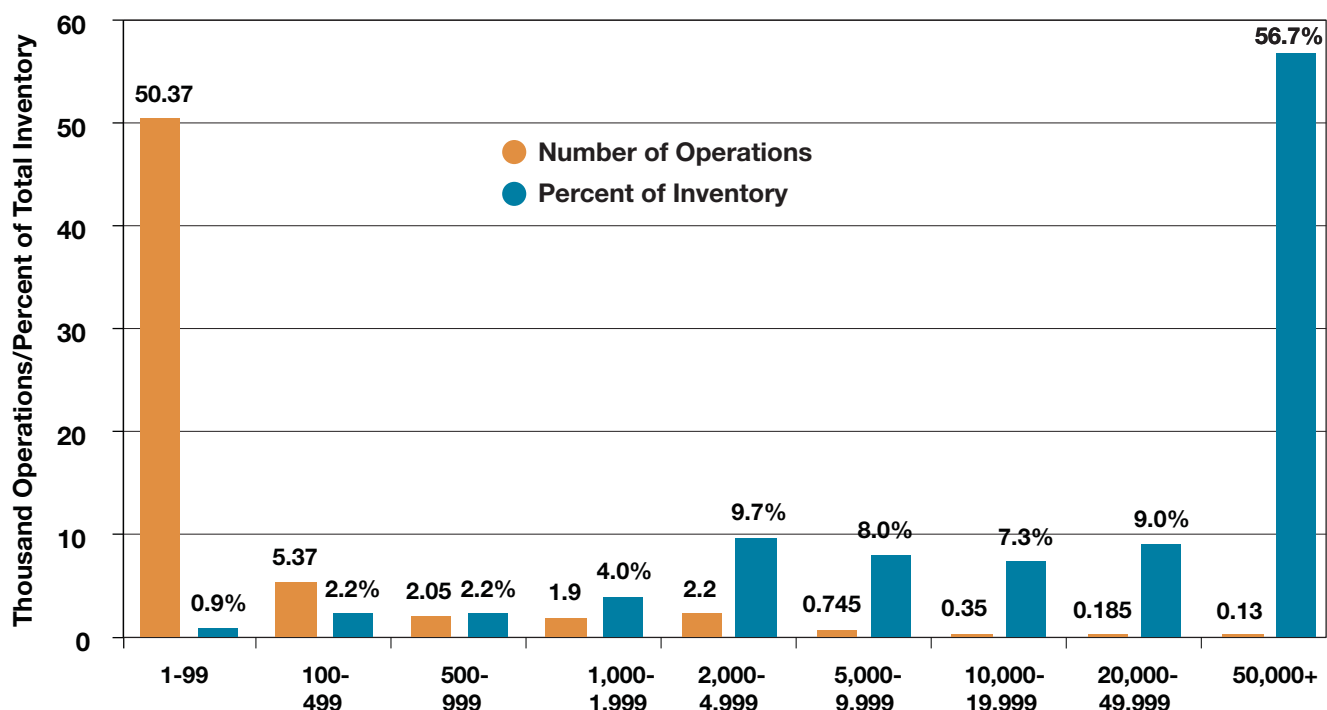
Inventory			Thousands of Operations by Inventory Size						
			Head in Inventory						Total
Year	Thousand Head	Head per Operation	1 - 99	100 - 499	500+	1,000+	2,000+	5,000+	
1977	56,539	87.39	504.01	120.99	22.00				647.00
1978	60,356	95.00	498.71	113.08	23.51				635.30
1979	67,318	103.05	501.69	124.12	27.44				653.24
1980	64,462	96.71	515.24	123.31	28.00				666.55
1981	58,698	101.32	445.49	106.59	27.23				579.31
1982	54,534	113.37	366.07	90.44	24.53				481.04
1983	56,694	122.69	340.58	93.81	27.73				462.11
1984	54,073	126.18	319.25	83.56	25.71				428.53
1985	52,314	134.63	286.76	75.77	26.03				388.57
1986	51,001	147.36	251.26	70.26	24.57				346.09
1987	54,384	165.48	230.38	73.29	24.98	8.54			328.64
1988	55,466	165.81	226.45	77.04	30.35	10.34			333.50
1989	53,788	173.88	205.02	74.95	29.73	10.84			309.70
1990	54,416	197.78	178.21	68.86	28.37	10.47			275.44
1991	57,649	227.20	157.41	66.01	30.47	10.92			253.89
1992	58,202	232.93	151.45	65.87	32.19	12.48			249.50
1993	57,940	257.11	137.50	56.94	30.77	12.14	3.74		225.21
1994	59,738	288.45	124.60	53.00	30.38	12.70	4.16		207.98
1995	58,201	320.57	108.80	45.51	28.24	12.52	4.80		181.75
1996	56,124	359.49	94.80	36.27	25.18	12.16	4.96	1.44	156.25
1997	61,158	500.64	69.46	28.01	24.61	12.94	6.18	1.83	122.16
1998	62,204	546.46	61.67	27.32	24.85	13.50	6.67	1.91	113.83
1999	59,335	602.63	52.73	22.85	22.88	13.63	7.13	2.01	98.46
2000	59,110	684.46	48.21	17.78	20.40	12.77	6.92	2.09	86.36
2001	59,722	738.40	45.81	15.41	19.66	12.46	6.99	2.20	80.88
2002	59,554	781.04	45.64	12.26	18.35	12.12	7.08	2.27	76.25
2003	60,453	821.37	44.29	11.62	17.70	12.01	7.14	2.27	73.60
2004	60,982	877.44	42.10	10.36	17.05	11.89	7.44	2.31	69.50
2005	61,463	913.54	40.56	10.12	16.60	11.86	7.60	2.36	67.28
2006	62,516	948.07	39.88	9.60	16.46	11.97	7.75	2.47	65.94
2007	63,947	847.54	52.45	7.08	15.93	12.31	8.26	2.86	75.45
2008	67,400	921.39	50.68	6.74	15.73	12.24	8.29	2.92	73.15
2009	65,327	914.30	50.40	6.10	14.95	11.75	8.20	2.95	71.45

Notes:

- 1) Categories for 500 head or more are cumulative (i.e. the 500+ column includes the 1,000+ column which includes the 2,000+)
- 2) USDA data for number of hog operations represent the number of "locations" that had "a" hog in inventory on the given date.

Sources: USDA, Hogs and Pigs Report (December 1977-2002)
 Livestock Operations (April 2004)
 Farms, Land in Farms and Livestock Operations (2005-2010)

U.S. Hog Operations by Size Groups and Percent of Inventory - 2009



Source: Farms, Land in Farms, and Livestock Operations, April 2010

Number of Operations by Size Group, Selected States and United States, 2006-2007^{1, 2}

Operations Having:														
State	1-99 Head		100-499 Head		500-999 Head		1,000-1,999 Head		2,000-4,999 Head		5,000+ Head		Total	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Ark.	600	610	34	32	48	44	34	33	28	25	6	6	750	750
Col.	740	745	23	21	10	6	5	3	9	10	13	15	800	800
Ill.	820	800	670	660	400	370	420	390	410	380	180	200	2,900	2,800
Ind.	1,300	1,290	510	530	300	280	240	230	330	340	120	130	2,800	2,800
Iowa	1,030	900	2,400	2,300	1,500	1,500	1,500	1,500	1,700	1,700	570	600	8,700	8,500
Kan.	860	860	240	240	90	90	90	90	75	75	45	45	1,400	1,400
Mich.	1,540	1,600	240	300	75	70	80	70	120	110	45	50	2,100	2,200
Minn.	1,200	1,200	1,200	1,100	700	690	600	600	800	800	300	310	4,800	4,700
Mo.	930	900	530	500	135	110	60	70	220	200	125	120	2,000	1,900
Neb.	800	750	800	750	350	350	270	270	190	190	90	90	2,500	2,400
N.C.	790	820	90	110	55	50	140	140	595	570	630	610	2,300	2,300
Ohio	2,700	2,800	600	600	200	190	290	270	180	200	30	40	4,000	4,100
Okla.	2,300	2,300	120	120	50	50	45	45	50	50	35	35	2,600	2,600
Pa.	2,400	2,500	320	310	130	120	100	90	220	250	30	30	3,200	3,300
S.D.	370	340	285	260	160	130	125	110	90	90	70	70	1,100	1,000
Texas	3,532	3,534	130	130	8	9	7	6	5	4	18	17	3,700	3,700
Wis.	1,540	1,550	410	400	120	130	80	70	40	40	10	10	2,200	2,200
Other States ³	16,430	16,645	1,000	900	160	150	130	135	220	200	150	160	18,090	18,190
U.S.	39,882	40,144	9,602	9,263	4,491	4,339	4,216	4,122	5,282	5,234	2,467	2,538	65,940	65,640

1 An operation is any farm having one or more hog or pig on hand at any time during the year.

2 Data for 2007 is the most recent available. State operation data is now available only in the Census of Agriculture.

3 Individual state estimates not available for the 33 other states.

Source: Farms, Land in Farms, and Livestock Operations 2007 Summary: Released February 1, 2008, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture.

Market Share by Operation Size

Number Marketed	1988	1991	1994	1997	2000	2003	2006
	(percent of total marketings)						
Under 1,000	32	23	17	5	2	1	1
1,000 - 1,999	19	20	17	12	7		
2,000 - 2,999	11	13	12	10	5		
1,000 - 3,000						8	5
3,000 - 4,999	10	12	12	10	7	4	3
5,000 - 9,999	9	10	12	11	10	9	6
10,000 - 49,999	12	13	13	17	18	19	21
50,000-499,999						19	21
50,000+	7	9	17	36	51		
500,000+						40	43

Source: 2007 Pork Industry Study (National Pork Board, PIC, Land O' Lakes, Monsanto Choice Genetics, Univ. of Mo., Iowa State Univ., Pork Magazine). These are the most recent data available.

Number, Percent and Market Share of U.S. Operations by Size (2006)

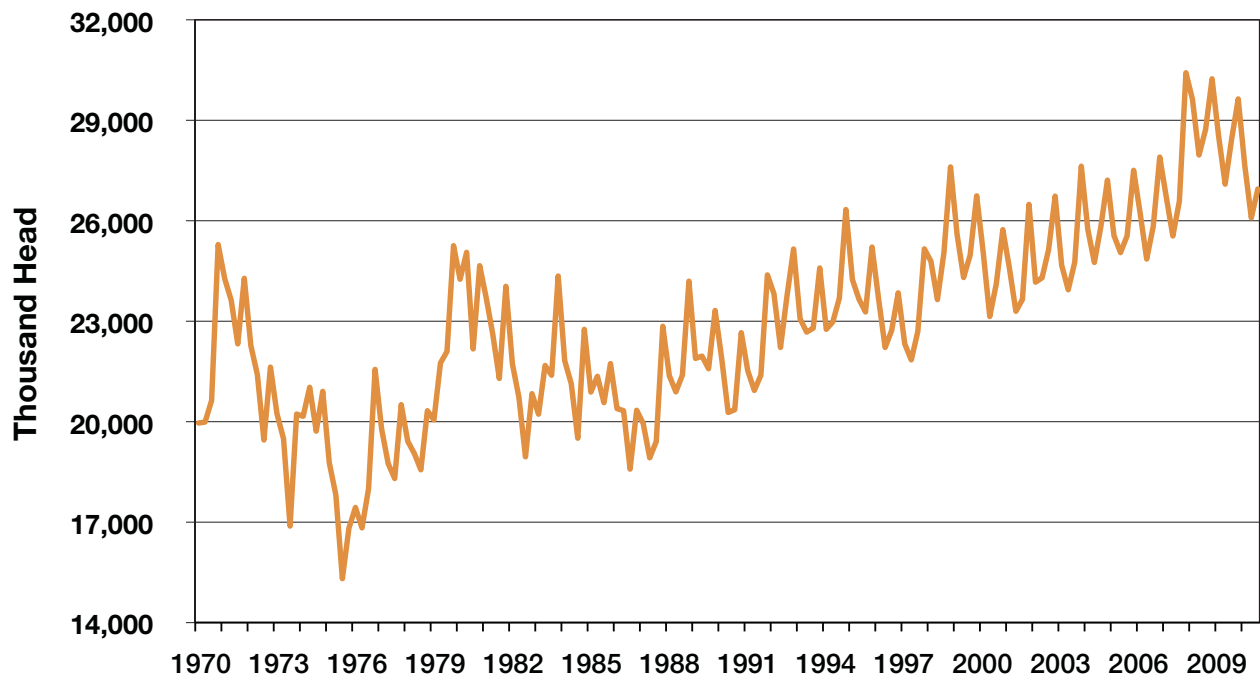
Number Marketed	Number of Operations	Percent of Operations	Percent Market Share
Under 1,000	48,434	86.1	1
1,000 - 2,999	4,025	7.1	5
3,000 - 4,999	1,150	2.0	3
5,000 - 9,999	1,100	1.9	6
10,000 - 49,999	1,450	2.6	21
50,000-499,999	164	0.3	21
500,000+	27	0.1	43
Total	56,350	100.0	100

Source: 1998 Pork Industry Study (National Pork Board, PIC, Land O' Lakes, Monsanto Choice Genetics, Univ. of Mo., Iowa State Univ., Pork '98). These are the most recent data available.



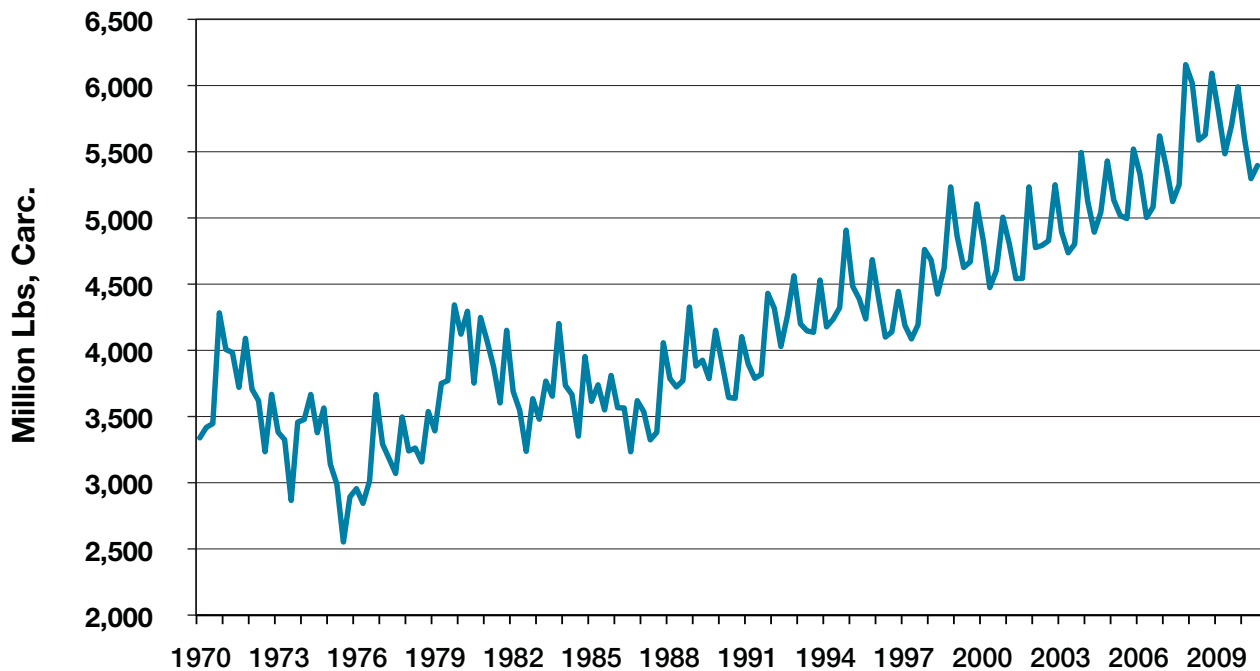
Technological innovations, such as raising pigs indoors and early weaning, have contributed to structural change in the pork industry. Indoor facilities allow one person to effectively manage the comfort and performance of more pigs. Early weaning protects young pigs from being infected with diseases carried by their mother, allows for more efficient use of space and maximizes the productive potential of sows and workers. All of these factors contribute to lower-cost pork for consumers.

Quarterly U.S. Commercial Hog Slaughter

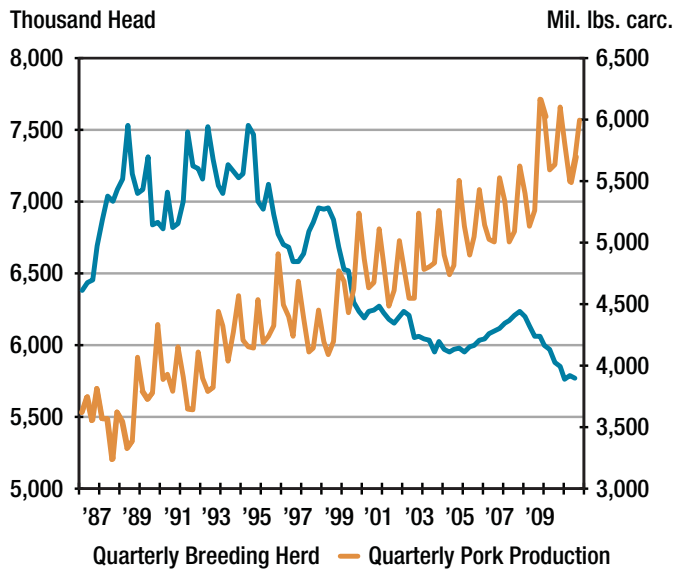
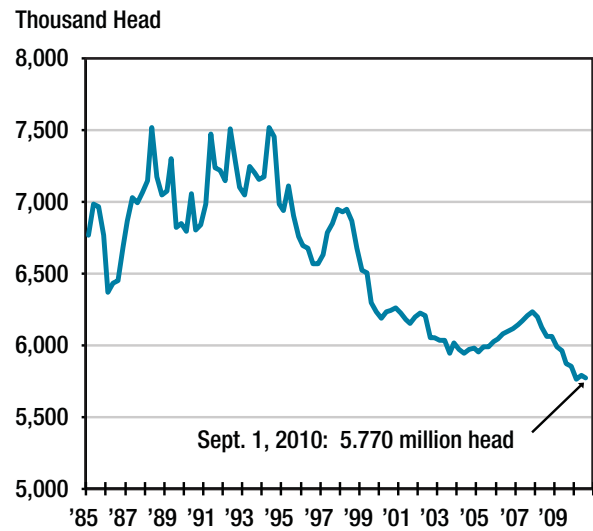
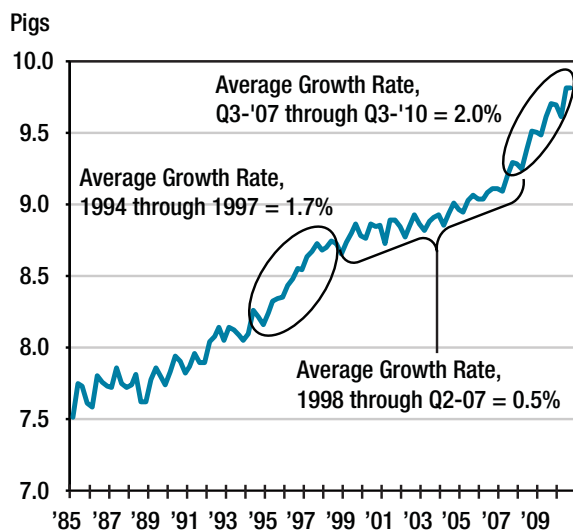
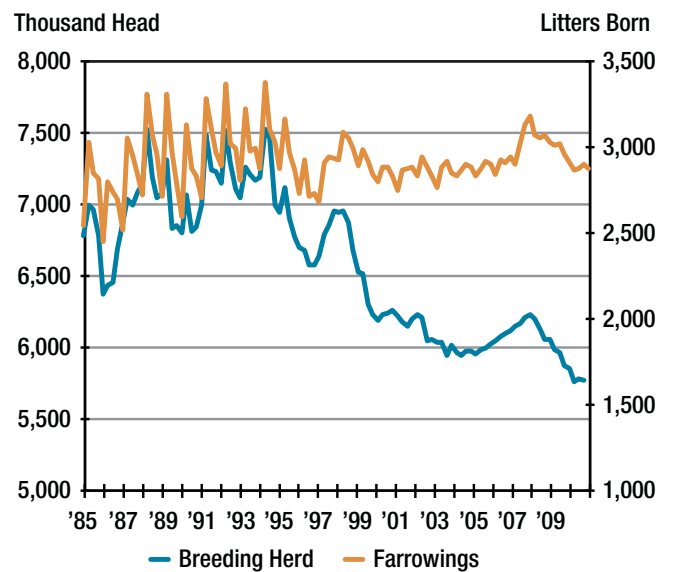


Source: USDA, Livestock Slaughter

Quarterly U.S. Commercial Pork Production



Source: USDA, Livestock Slaughter

U.S. Breeding Herd and Production**U.S. Breeding Herd, Quarterly****U.S. Pigs Saved Per Litter****U.S. Swine Breeding Herd and Farrowings**

Source: USDA, Hogs and Pigs and Livestock Slaughter



U.S. Commercial Livestock Slaughter and Meat Production

Year	Hog Slaughter (1,000 head)	Pork Production (million lbs.)	Cattle Slaughter (1,000 head)	Beef Production (million lbs.)	Chicken Slaughter (million head)	Chicken Production (million lbs.)	Turkey Slaughter (million head)	Turkey Production (million lbs.)
1950	69,543		17,901	9,248				
1951	76,061		16,376	8,549				
1952	77,690		17,856	9,337				
1953	66,913		23,606	12,055				
1954	64,827		25,017	12,601				
1955	74,216	13,477	25,723	13,213				
1956	78,513	13,805	26,862	14,090				
1957	72,595	12,822	26,232	13,852				
1958	70,965	12,674	23,555	12,983				
1959	81,582	14,540	22,931	13,233				
1960	79,036	13,905	25,224	14,374	1,534	3,699	71	948
1961	77,335	13,647	25,635	14,930	1,726	4,287	93	1,256
1962	79,334	13,953	26,083	14,931	1,763	4,361	79	1,097
1963	83,324	14,492	27,232	16,049	1,835	4,607	82	1,164
1964	83,019	14,597	30,818	18,037	1,915	4,810	88	1,253
1965	73,784	12,782	32,347	18,325	2,058	5,194	93	1,330
1966	74,011	12,797	33,727	19,493	2,236	5,604	103	1,478
1967	82,124	14,130	33,869	19,991	2,319	5,876	114	1,665
1968	85,160	14,516	35,026	20,664	2,336	5,939	97	1,456
1969	83,839	14,244	35,237	20,960	2,516	6,484	95	1,433
1970	85,817	14,699	35,025	21,505	2,770	7,161	106	1,567
1971	94,438	16,006	35,585	21,733	2,779	7,281	112	1,642
1972	84,707	14,422	35,779	22,250	2,936	7,823	121	1,797
1973	76,795	13,223	33,687	21,089	2,908	7,786	123	1,788
1974	81,762	14,331	36,812	22,843	2,900	7,917	127	1,836
1975	68,687	11,779	40,911	23,672	2,922	7,966	119	1,716
1976	73,784	12,688	42,654	25,667	3,253	8,987	134	1,950
1977	77,303	13,248	41,856	24,986	3,334	9,227	128	1,892
1978	77,315	13,393	39,552	24,009	3,516	9,883	132	1,983
1979	89,099	15,451	33,678	21,262	3,843	10,916	146	2,182
1980	96,074	16,617	33,807	21,469	3,929	11,272	159	2,332
1981	91,575	15,873	34,953	22,214	4,076	11,906	166	2,509
1982	82,190	14,229	35,843	22,366	4,068	12,039	160	2,459
1983	87,584	15,199	36,649	23,060	4,133	12,389	165	2,563
1984	85,168	14,812	37,582	23,418	4,272	12,999	166	2,574
1985	84,492	14,807	36,293	23,557	4,439	13,569	175	2,800
1986	79,598	14,063	37,288	24,213	4,643	14,266	197	3,133
1987	81,081	14,374	35,647	23,405	4,972	15,502	231	3,717
1988	87,795	15,684	35,079	23,424	5,159	16,124	237	3,923
1989	88,691	15,813	33,917	22,974	5,499	17,334	252	4,175
1990	85,135	15,354	33,243	22,634	5,841	18,555	271	4,561
1991	88,169	15,999	32,689	22,800	6,140	19,728	277	4,652
1992	94,889	17,234	32,874	22,968	6,425	21,052	281	4,829
1993	93,068	17,088	33,324	22,942	6,681	22,178	276	4,848
1994	95,697	17,696	34,196	24,278	7,072	23,846	279	4,992
1995	96,326	17,849	35,639	25,115	7,371	25,021	281	5,129
1996	92,394	17,117	36,584	25,419	7,546	26,336	293	5,466
1997	91,960	17,274	36,318	25,384	7,736	27,271	290	5,478
1998	101,029	19,010	35,465	25,653	7,838	27,863	273	5,281
1999	101,544	19,308	36,150	26,386	8,112	29,741	265	5,297
2000	97,976	18,952	35,631	26,777	8,261	30,495	268	5,402
2001	97,962	19,160	34,771	26,107	8,406	31,266	268	5,562
2002	99,927	19,682	35,000	27,000	8,546	32,240	271	5,713
2003	100,931	19,966	34,907	26,238	8,537	32,749	268	5,650
2004	103,463	20,529	32,728	24,548	8,752	34,063	254	5,454
2005	103,582	20,704	32,388	24,683	8,854	35,365	248	5,504
2006	104,737	21,074	33,698	26,152	8,838	35,500	255	5,682
2007	109,172	21,963	34,264	26,421	8,903	36,159	265	5,951
2008	116,452	23,367	34,365	26,561	8,921	36,906	271	6,247
2009	113,618	23,020	33,338	25,965	8,520	35,510	246	5,662

Source: USDA, Red Meat Yearbook and Poultry Yearbook, 2008; Livestock Slaughter and Poultry Slaughter, 2009 and 2010.
*Pork and beef production is carcass weight. Chicken and turkey production is ready-to-cook weight.

Productivity Measures of U.S. Pork Industry

Year	Pigs/ Litter	Litters/ Breeding Animal	Pigs Marketed/ Breeding Animal	Pork Production/ Breeding Animal (lbs.)	Live Weight (lbs.)	Dressing Percent	Dressed Weight (lbs.)	Lard Yield (lbs.)	Retail Meat (lbs.)	Retail Meat yield (lbs.)
1974	7.10	1.43	8.52	1706.00	245.3	77.8	190.7		129.0	52.6
1975	7.17	1.36	8.30	1583.74	240.3	77.6	186.4	14.8	130.0	54.1
1976	7.26	1.43	8.19	1537.52	238.3	78.4	186.8	14.4	131.0	55.0
1977	7.15	1.42	8.14	1535.37	237.5	71.5	169.8	13.5	131.0	55.2
1978	7.12	1.40	7.83	1487.15	240.2	71.4	171.5	13.0	132.0	55.0
1979	7.09	1.46	8.02	1535.79	242.0	71.2	172.3	13.0	133.0	55.0
1980	7.22	1.51	9.21	1766.39	242.0	71.0	171.9	12.8	133.0	55.0
1981	7.39	1.53	9.89	1891.02	243.1	71.0	172.5	12.9	134.0	55.1
1982	7.38	1.57	10.11	1917.80	242.8	70.9	172.3	11.2	134.0	55.2
1983	7.47	1.61	10.26	1954.39	243.4	71.3	173.7	11.2	135.0	55.5
1984	7.50	1.62	10.81	2058.53	243.8	71.2	173.6	11.0	135.0	55.4
1985	7.65	1.63	11.22	2140.32	245.0	71.4	174.9	11.0	136.0	55.5
1986	7.72	1.65	11.23	2157.08	246.3	71.8	176.8	11.0	138.0	56.0
1987	7.76	1.63	10.62	2166.23	247.8	71.5	177.3	10.6	137.0	55.3
1988	7.70	1.67	11.05	2212.50	249.2	71.8	178.9	10.6	138.0	55.4
1989	7.79	1.68	11.44	2225.2	248.8	71.8	178.7		138.0	55.5
1990	7.88	1.66	11.26	2209.4	249.9	72.3	180.6		140.6	56.3
1991	7.90	1.67	11.12	2187.1	252.2	72.0	181.7		141.3	56.0
1992	8.08	1.69	11.99	2357.9	253.0	71.8	181.8		142.1	56.2
1993	8.10	1.68	11.92	2366.6	254.3	72.3	183.8		143.0	56.2
1994	8.19	1.70	12.02	2415.5	255.7	72.6	185.5		143.9	56.3
1995	8.31	1.71	12.68	2554.0	256.5	72.4	185.8		144.1	56.2
1996	8.50	1.68	12.61	2537.6	254.0	73.2	186.0		144.3	56.8
1997	8.68	1.69	12.25	2495.3	256.3	73.5	188.4		146.2	57.0
1998	8.71	1.76	13.29	2727.2	256.6	73.6	188.8		146.5	57.1
1999	8.79	1.82	14.37	3008.1	258.9	73.7	190.9		148.2	57.2
2000	8.83	1.83	14.24	3037.4	262.5	74.1	194.5		150.9	57.5
2001	8.84	1.84	14.20	3111.3	264.3	74.4	196.5		152.5	57.7
2002	8.85	1.87	14.62	3246.6	265.3	74.4	197.5		153.3	57.8
2003	8.88	1.91	14.78	3381.5	266.6	74.6	198.8		154.2	57.9
2004	8.94	1.93	15.14	3505.8	266.9	74.7	199.3		154.7	58.0
2005	9.02	1.93	15.18	3519.9	268.9	74.7	200.9		155.9	58.0
2006	9.08	1.95	15.01	3544.7	269.3	74.9	201.7		156.5	58.1
2007	9.22	2.05	15.24	3631.3	269.1	74.9	201.5		156.4	58.1
2008	9.41	2.04	16.70	3947.2	268.4	74.9	200.9		155.9	58.1
2009	9.62	1.98	17.33	4003.7	270.8	74.9	202.9		157.5	58.1

Notes:

Slaughter/Breeding Animal computed as U.S.-born Barrow & Gilt slaughter divided by average sow herd for the year.

Pork Production/Breeding Animal computed as U.S. pork production (all of U.S. born pigs' weights, 20#/head on imported feeder pigs, none of the production from imported slaughter hogs) divided by average breeding herd.

Estimated Daily U.S. Slaughter Capacity

	Company	Plant	Fall 2004		Fall 2005		Fall 2006		Fall 2007		Spring 2009		
			Plant	Co. Total	Plant	Co. Total	Plant	Co. Total	Plant	Co. Total	Plant	Co. Total	
1	Smithfield	Tar Heel, N.C.	32,000		32,000		32,000		32,000		33,000		
	Smithfield, Va.	Gwaltney, Va.	9,500		10,800		10,800		9,500		9,500		
		Morrell	Sioux Falls, S.D.	17,000	17,000		17,000		19,000		19,000		
			Sioux City, Iowa	14,500	14,500		14,500		11,200		14,000		
		Farmland	Crete, Neb.	10,400	10,400		10,400		10,400		10,500		
			Denison, Iowa	9,200	9,200		9,200		9,200		9,300		
			Monmouth, Ill.	9,000	101,600	9,000	102,900	9,000	10,400		10,500		
		Premium Standard	Milan, Mo.	7,300	7,300		7,300		10,200		10,500		
			Clinton, N.C.	10,000	17,300	10,000	17,300	10,000	120,200	10,000	121,900	10,000	126,300
2	Tyson Foods (IBP)	Waterloo, Iowa	19,200		19,200		19,200		19,350		19,350		
	Dakota Dunes, S.D.	Logansport, Ind.	14,500		14,500		14,500		14,800		14,500		
		Storm Lake, Iowa	14,500		15,000		15,000		15,500		15,500		
		Col. Junction, Iowa	9,800		9,800		9,800		9,500		10,000		
		Madison, Neb.	7,500		7,500		7,500		7,750		7,800		
			Perry, Iowa	6,800	72,300	6,800	72,800	6,800	72,800	7,400	74,300	7,400	74,550
3	Swift	Worthington, Minn.	17,500		17,500		17,500		18,500		18,500		
	Greeley, Col.	Marshalltown, Iowa	18,500		18,500		18,500		18,500		18,500		
			Louisville, Ky.	10,000	46,000	10,000	46,000	10,000	46,000	10,000	47,000	10,000	47,000
4	Excel	Beardstown, Ill.	18,000		18,000		18,000		18,000		20,000		
	Wichita, Kan.	Ottumwa, Iowa	18,000	36,000	18,000	36,000	18,000	36,000	18,000	36,000	18,500	38,500	
5	Hormel	Austin, Minn.	18,000		18,000		18,000		19,000		19,000		
			Fremont, Neb.	8,800	26,800	10,500		10,500		10,500		10,500	
		Clougherty	Los Angeles, Calif.	7,300	7,300	7,300	35,800	7,300	35,800	7,300	36,800	7,500	37,000
6	Seaboard Farms	Guyton, Okla.	16,000	16,000	16,000	16,000	16,000	16,000	16,800	16,800	19,200	19,200	
7	Triumph Foods	St. Joseph, Mo.			8,000	8,000	16,000	16,000	17,500	17,500	19,000	19,000	
8	Indiana Packing Co.	Delphi, Ind.	12,500	12,500	12,500	12,500	14,000	14,000	15,000	15,000	16,500	16,500	
9	Hatfield Quality Meats	Hatfield, Pa.	10,200	10,200	10,200	10,200	10,200	10,200	10,600	10,600	10,600	10,600	
10	J.H Routh	Sandusky, Ohio	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	
11	Meadowbrook Farms	Rantoul, Ill.	4,000	4,000	4,000	4,000	3,800	3,800	3,800	3,800	Closed	Closed	
12	Sioux-Preme Packing	Sioux Center, Iowa	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	4,200	4,200	
13	Johnsonville Sausage	Watertown, Wis.	600		600		600		650		650		
			Momence, Ill.	1,350		1,350		1,350		1,600		1,600	
		Oldham's Sausage	Holton, Kan.	600	2,550	600	2,550	600	2,550	900	3,150	1,000	3,250
14	Greenwood Packing	Greenwood, S.C.	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	
15	Pine Ridge Farms	Des Moines, Iowa	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,850	2,850	
16	Sara Lee (Jimmy Dean)	Newbern, Tenn.	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,800	2,800	
17	Pork King Packing	Marengo, Ill.	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
18	Premium Iowa Pork	Hospers, Iowa							1,600	1,600	2,400	2,400	
19	Fisher Ham and Meat	Spring, Texas	1500		1500		1500		1,500		1,500		
			Navasota, Texas	500	2000	500	2000	500	2000	500	2,000	500	2,000
20	USA Pork Products	Hazellton, Pa.	2000	2000	2000	2000	2000	2000	2,000	2,000	2,000	2,000	
20	Abbyland Foods	Curtiss, Wis.	1,700	1,700	1,700	1,700	1,700	1,700	2,000	2,000	2,000	2,000	
22	Bob Evans Farms	Bidwell, Ohio	200		200		200		220		220		
			Xenia, Ohio	300		300		300		330		330	
			Hillsdale, Mich.	300		300		300		330		330	
			Galva, Ill.	300		300		300		330		330	
		Owens Sausage	Richardson, Texas	600	1,700	600	1,700	600	1,700	440	1,650	440	1,650
23	Spectrum Meats	Mount Morris, Ill.	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	
24	Yosemite Meats	Modesto, Calif.	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
24	Dakota Pork, Inc	Estherville, Iowa									1,500	1,500	
26	Leidy's	Souderton, Pa.	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	
27	Vin-Lee-Rom	Mentone, Ind.	1,100	1,100	1,100	1,100	1,100	1,100	1,300	1,300	1,300	1,300	
27	Martin's Pork Products	Falcon, N.C.	1,000	1,000	1,000	1,000	1,000	1,000	1,200	1,200	1,300	1,300	
29	Heritage Acres Foods	Pleasant Hope, MO									1,200	1,200	
29	Verschoor Meats	Sioux City, Iowa	800	800	800	800	800	800	800	800	1,200	1,200	
30	Olson Meat Company	Orland, Calif.							1,200	1,200	1,000	1,000	
30	Odom's Sausage	Little Rock, AR	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
31	The Pork Company	Warsaw, N.C.	750	750	750	750	750	750	900	900	900	900	
32	Jim's Farm Meats	Atwater, Calif.							450	450	850	850	
33	Cloverdale Foods	Minot, N.D.	920	920	920	920	920	920	600	600	800	800	
33	Swaggerty Sausage Co.	Kodak, Tenn.									800	800	
35	Independent Meats	Twin Falls, Idaho	650	650	650	650	650	650	650	650	750	750	
36	Peoria Packing	Chicago, Ill.	750	750	750	750	750	750	750	750	600	600	
37	Masami Meat Company	Klammath Falls, Ore.	650	650	650	650	650	650	550	550	550	550	
38	Dekalb Packing Company	De Kalb, Ill.	500	500	500	500	500	500	500	500	500	500	
39	Parks Family Meats	Warsaw, N.C.	300	300	300	300	300	300	450	450	450	450	
39	Calihan Packing Company	Peoria, Ill.	425	425	425	425	425	425	425	425	450	450	
41	Pioneer Packing Company	Bowling Green, Ohio									425	425	
42	F.B. Purnell Sausage	Simonsville, Ky.	400	400	400	400	400	400	400	400	400	400	
42	J.C. Potter	Durant, Okla.	400	400	400	400	400	400	400	400	400	400	
42	Williams Sausage Co.	Union City, Ky.	400	400	400	400	400	400	400	400	400	400	
45	Carleton Packing Company	Carleton, Ore.	375	375	375	375	375	375	375	375	375	375	
46	Morris Meat Packing	Morris, Ill.	200	200	200	200	200	200	200	200	300	300	
47	Wampler's Sausage	Lenoir City, Tenn.	200	200	200	200	200	200	250	250	250	250	
47	VanDeRose Farms	Wellsburg, Iowa									250	250	
49	Dean Sausage	Atalla, Ala.	225	225	225	225	225	225	225	225	225	225	
50	Southern Pride Meats	Goldsboro, N.C.									210	210	
51	Avco	Gadsen, Ala.							205	205	205	205	
52	Dealaman Eterprises, Inc.	Warren, N.J.							200	200	200	200	
53	Weltin Meat Packing	Minden City, Mich.							175	175	175	175	
54	Southern Quality Meats	Pontotoc, Miss.	130	130	130	130	130	130	130	130	150	150	
55	Gunroe Sausage	Goode, Va.	100	100	100	100	100	100	100	100	110	110	
56	Dayton Meat Co.	Dayton, Ore.									100	100	
56	Kapowsin Meats, Inc.	Graham, Wash.							100	100	100	100	
TOTAL CAPACITY			407,875		411,575		420,875		428,335		444,925		

Source: Paragon Economics, Inc. and National Hog Farmer, May 2009

U.S. Packing Plant Closings — 1993-2009

Company	Plant	Date Closed	Capacity
Swift	St. Joseph, Mo.	December 1993	10,000
Seaboard	Alber Lea, Minn.	February 1994	14,000
Thorn Apple Valley	Hyrum, Utah	1995	1,500
Reeves Packing	Ada, Okla.	1995	400
Worth'ton Pack	Worthington, Ind.	April 1996	4,700
Premium Pork	Moultrie, Ga.	April 1996	4,700
Ohio Packing Co.	Columbus, Ohio	April 1996	900
IBP	Council Bluffs, Iowa	April 1997	7,300
Dakota Pork	Huron, S.D.	August 1997	5,850
Thorn Apple Valley	Detroit, Mich.	July 1998	14,000
Fisher Packing	Louisville, Ky.	1998	3,000
Field Packing	Owensboro, Ky.	July 1999	1,200
AVA Pork	Shamokin, Pa.	February 2000	2,500
Farmland	Dubuque, Iowa	June 2000	11,000
Brown Packing	Little Rock, Ark.	June 2000	600
Fineberg Packing	Memphis, Tenn.	February 2001	500
Excel	Marshall, Mo.	July 2001	8,000
Mosby Packing Co.	Meridian, Miss.	July 2001	400
AMPAC/Iowa Pack	Chicago, Ill.	December 2001	3,600
Hormel	Rochelle, Ill.	January 2003	7,100
Metzger Foods	Paduca, Ky.	March 2003	250
Simeus Foods	Forest City, N.C.	October 2003	300
America's Family Farms	Alcester, S.D.	November 2003	600
RC Pork (Pork Packers Int'l)	Downs, Kan.	May 2004	1,500
Smithfield Foods	Smithfield, Va.	September 2005	7,800
Bryan Foods (Sara Lea)	West Point, Miss.	March 2006	6,200
Lowell Packing	Fitzgerald, Ga.	June 2005	350
Meadowbrook Farms	Rantoul, Ill.	December 2008	3,800
TOTAL CAPACITY			122,050

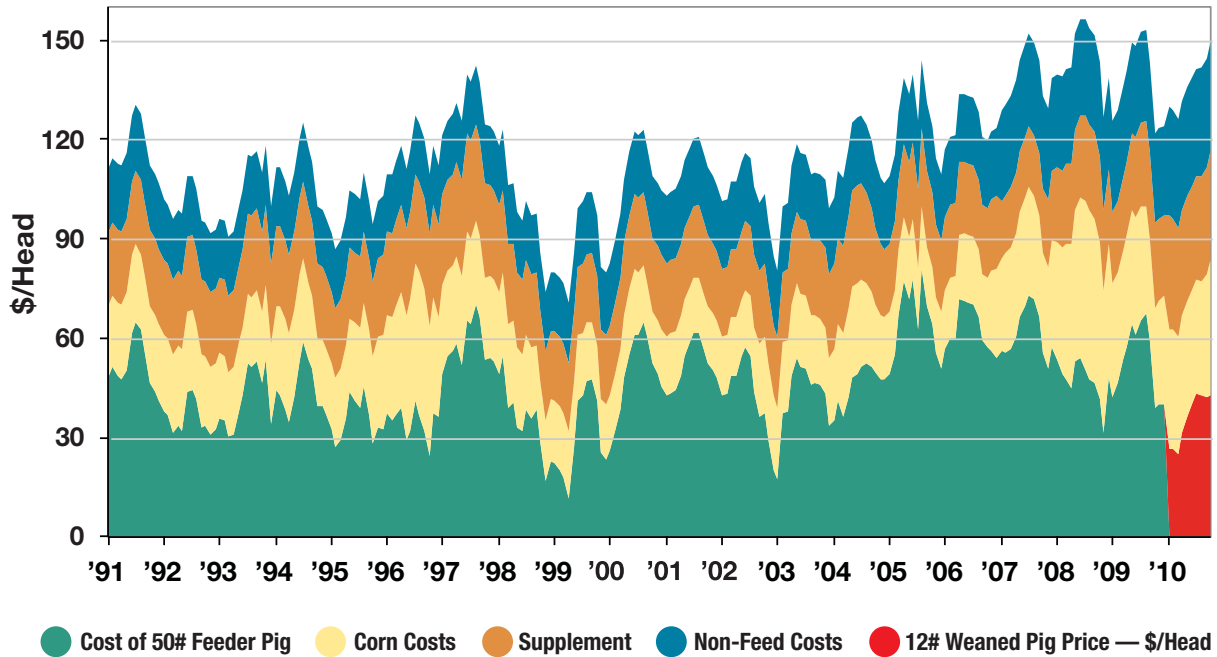
Source: Paragon Economics, Inc.

Estimated Daily U.S. Slaughter Capacity – Sows & Boars

Rank	Company	Plant	Fall 2006		Fall 2007		Spring 2009	
			Plant	Co. Total	Plant	Co. Total	Plant	Co. Total
1	Johnsonville Foods	Watertown, Wis.	600		650		650	
		Momence, Ill.	1,350		1,600		1,600	
	Oldham's Sausage	Holton, Kan.	600	2,550	900	3,150	1,000	3,250
2	Pine Ridge Farms	Des Moines, Iowa	2,500	2,500	2,500	2,500	2,850	2,850
3	Jimmy Dean (Sara Lee)	Newburn, Tenn.	2,600	2,600	2,600	2,600	2,800	2,800
4	Pork King Packing	Marengo, Ill.	2,000	2,000	2,000	2,000	2,000	2,000
4	USA Pork Products*	Hazellton, Pa.	2,000	2,000	2,000	2,000	2,000	2,000
4	Abbyland Foods	Curtiss, Wis.	1,700	1,700	2,000	2,000	2,000	2,000
7	Bob Evans Farms	Bidwell, Ohio	200		220		220	
		Xenia, Ohio	300		330		330	
		Hillsdale, Mich.	300		330		330	
		Galva, Ill.	300		330		330	
	Owens Sausage	Richardson, Texas	600	1,700	440	1,650	440	1,650
8	Odom's Sausage	Little Rock, Ark.	1,000	1,000	1,000	1,000	1,000	1,000
9	Calihan Packing Company	Peoria, Ill.	425	425	425	425	450	450
10	Pioneer Packing Company	Bowling Green, Ohio					425	425
11	F.B. Purnell Sausage	Simonsville, Ky.	400	400	400	400	400	400
11	J.C. Potter Sausage	Durant, Okla.	400	400	400	400	400	400
11	Williams Sausage Company	Union City, Ky.	400	400	400	400	400	400
14	Swaggerty Sausage Co	Kodak, Tenn.					300	300
15	Dean Sausage	Atalla, Ala.	225	225	250	250	250	250
16	Wampler's Sausage	Lenoir City, Tenn.	200	200	225	225	225	225
17	Southern Pride Meats	Goldsboro, N.C.					210	210
18	Avco	Gadsden, Ala.	205	205	205	205	205	205
19	Gunnore Sausage	Goode, Va.	100	100	100	100	110	110
	TOTAL			18,405		19,305		20,925

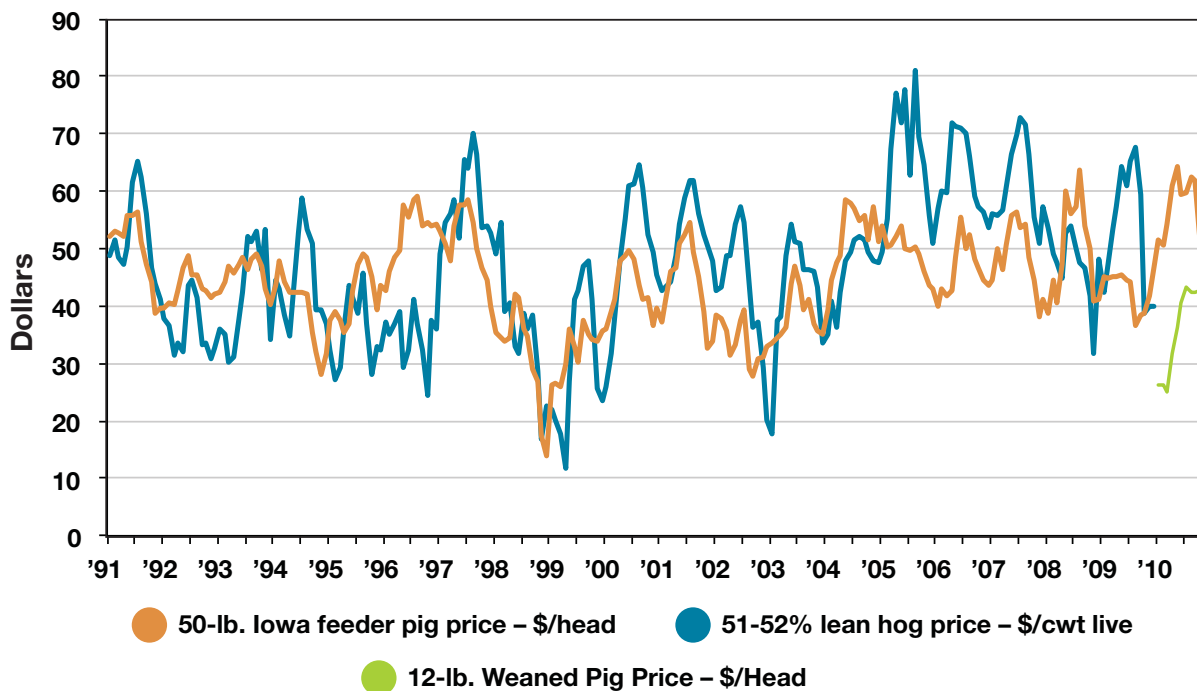
* USA Pork Products handles 80 percent boars, 20 percent butcher hogs

Cost to Produce a Market Hog — Monthly



Source: Iowa State University, Department of Economics, Estimated Livestock Costs and Returns

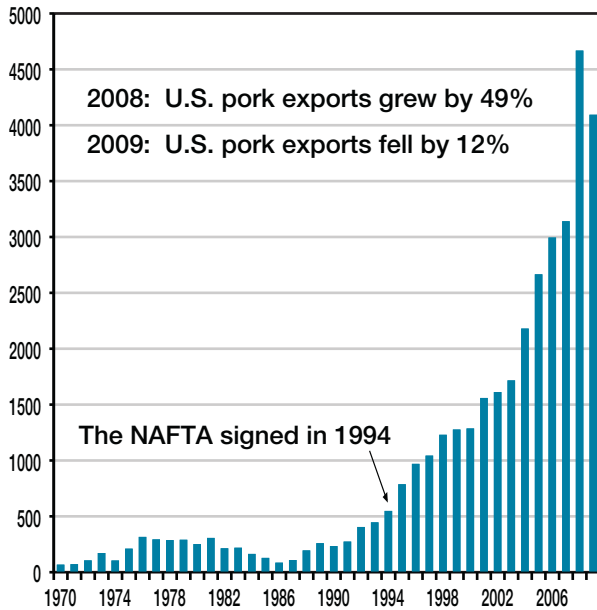
Feeder Pig & Market Hog Prices — Monthly



Source: Iowa State University, Department of Economics, Estimated Livestock Costs and Returns

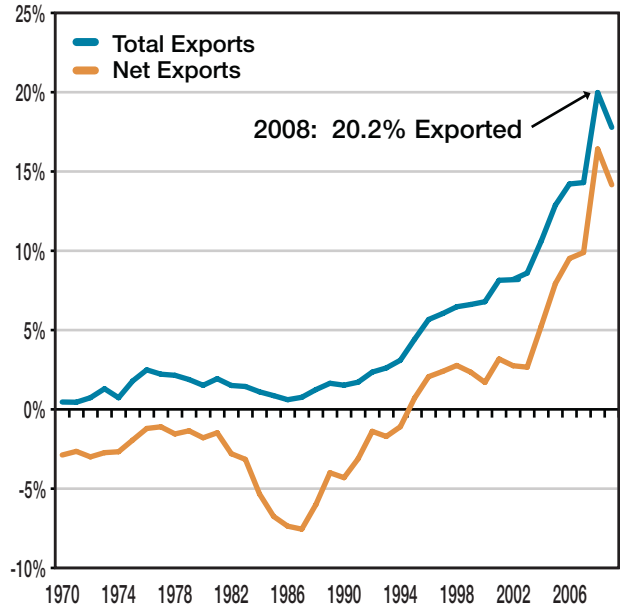
U.S. Pork Exports

Mil. lbs. carcass



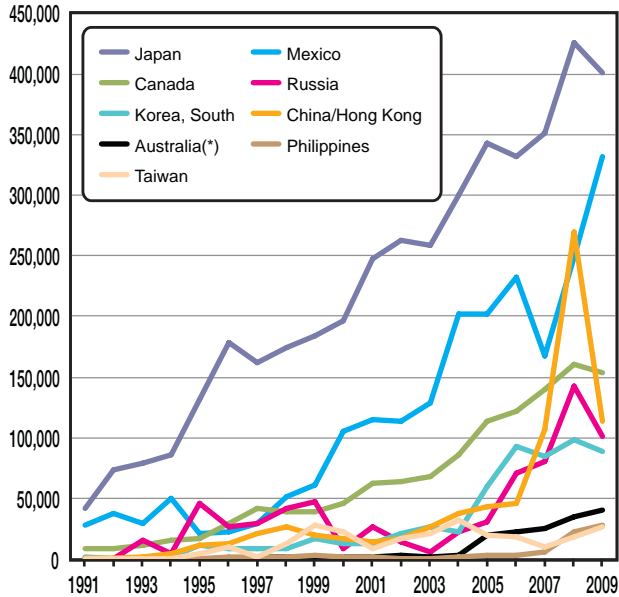
U.S. Total & Net Pork Exports (percent of production)

Percent



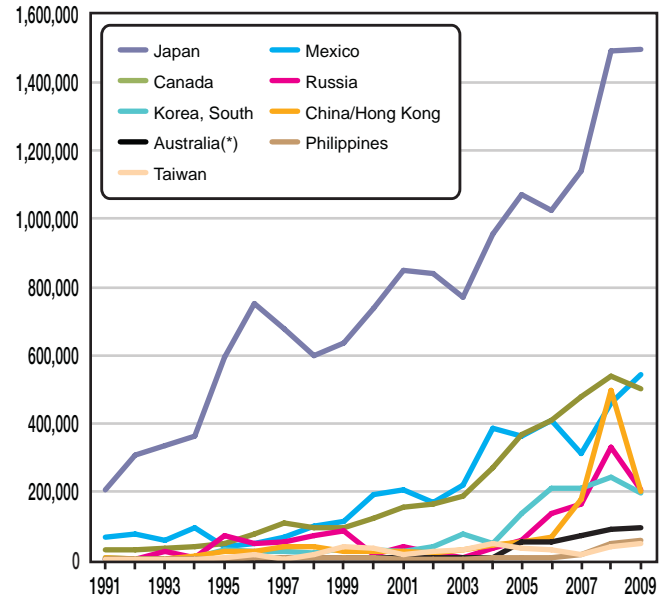
U.S. Pork Export Markets by Volume

Metric tons



U.S. Pork Export Markets by Value

Million \$



Source: USDA, Economic Research Service

Hog-Corn Price Ratio

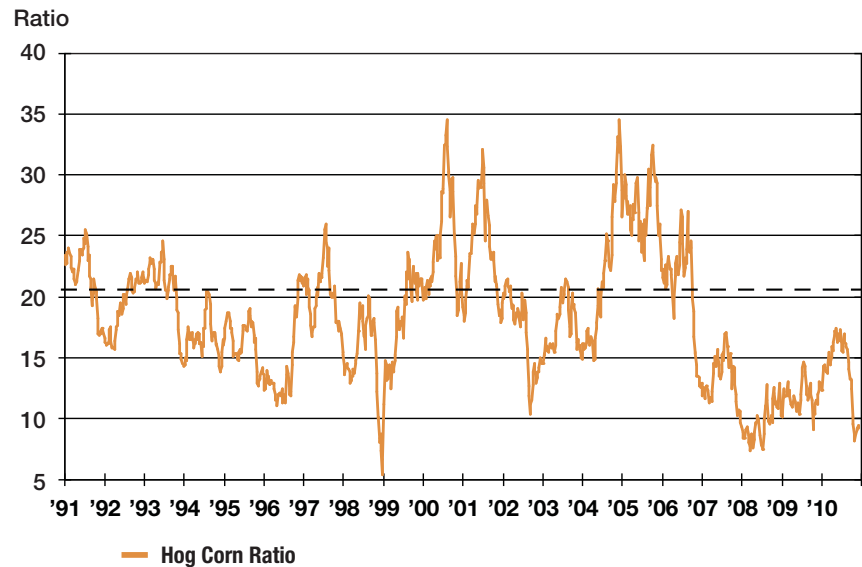
The hog-corn price ratio is a time-honored measure of pork production profitability, and, as such, is a good predictor of future production levels. The reason it works is that feed represents 65 to 70 percent of the cost of producing a pig while corn, or a close substitute, such as grain sorghum or barley, makes up about 60 percent of total feed costs.

The hog-corn price ratio is simply the ratio of the market hog price in dollars per 100 pounds (cwt.) to the price of corn in dollars per bushel. So if hogs are selling for \$50 per cwt. and corn costs \$2.50 per bushel, the hog-corn price ratio is 20.

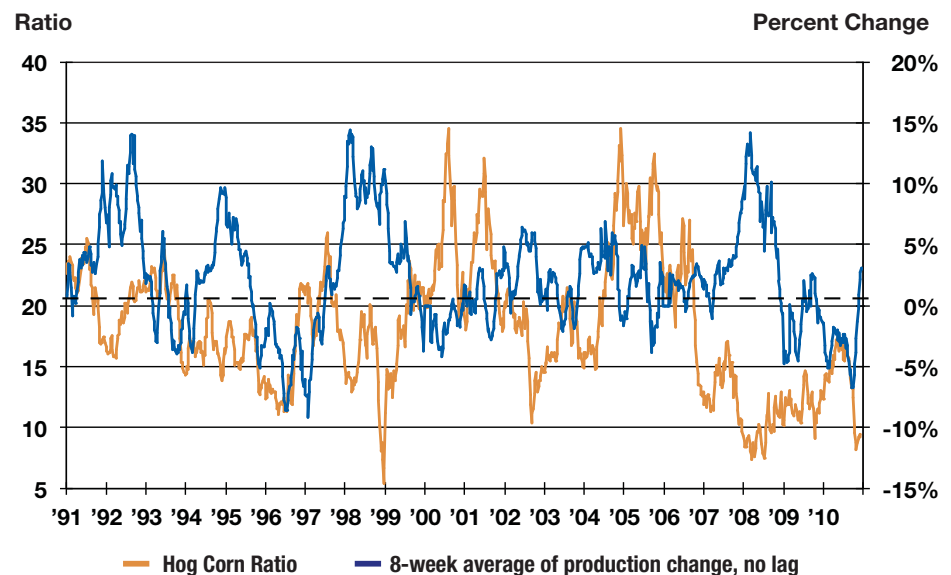
History tells us that a hog-corn price ratio of 20 or greater suggests that pork production will exceed year-earlier levels 12 to 18 months later. Conversely, a hog-corn price ratio of 16 or less suggests that pork production will fall below year-earlier levels in about 12 to 18 months.

This lead-lag relationship was once a function of grain producers' decisions on whether to sell corn or feed it to livestock. In this age of specialized production, many pork producers do not raise their own grain. However, the potential profitability indicated by the hog-corn price ratio is still a good indicator of the incentives that the marketplace provides producers to either expand or contract production.

Hog-Corn Price Ratio



Hog-Corn Price Ratio and Pork Production

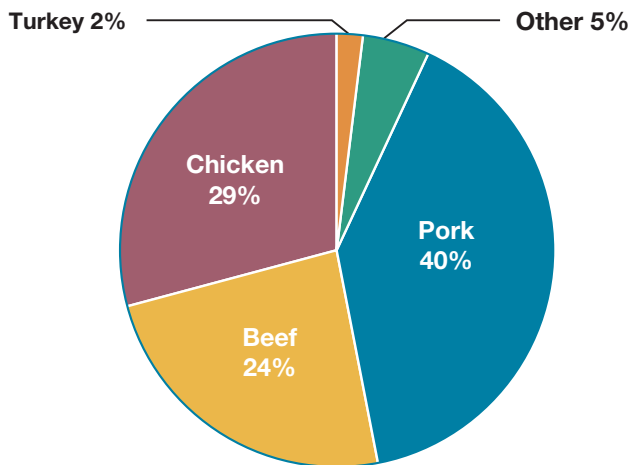


World Pork Consumption

World Per Capita Pork Consumption, Lbs., Carcass Weight

Rank	Country	2008	2009	2010	Rank	Country	2008	2009	2010
1	Belarus	99.0	92.5	94.0	26	Moldova	34.6	28.7	30.6
2	EU-27	94.3	93.2	92.1	27	Philippines	29.1	29.1	30.4
3	China/Hong Kong	77.7	80.8	82.1	28	Panama	24.7	26.2	29.1
4	Serbia	80.0	76.7	78.7	29	Brazil	26.8	26.9	28.0
5	Taiwan	78.7	81.3	78.5	30	Uruguay	21.6	22.7	25.1
6	Montenegro	91.0	88.6	72.7	31	Dominican Republic	21.3	23.3	24.5
7	Switzerland	73.8	73.4	72.5	32	Macedonia	21.4	22.4	24.5
8	Korea, South	69.2	67.2	69.0	33	Cuba	21.8	22.0	22.5
9	Bahamas, The	43.4	57.3	63.9	34	Trinidad and Tobago	17.9	17.9	19.7
10	United States	63.8	64.6	59.9	35	Korea, North	17.1	16.7	16.8
11	Singapore	53.6	57.3	59.1	36	Albania	13.4	17.6	15.0
12	Croatia	57.3	56.9	58.4	37	Angola	15.3	16.0	14.8
13	Norway	57.5	55.8	55.1	38	Argentina	13.7	13.9	14.3
14	Canada	56.3	56.1	52.0	39	Georgia	17.1	13.8	13.4
15	Chile	45.8	49.0	50.0	40	Armenia	16.3	13.4	13.4
16	Australia	47.8	48.4	48.7	41	Kyrgyzstan	11.0	11.0	11.9
17	Russia	47.9	47.2	48.5	42	Guatemala	11.2	11.7	11.7
18	Vietnam	47.3	46.7	45.8	43	Bosnia & Herzegovina	10.1	10.5	11.4
19	New Zealand	44.9	47.2	45.6	44	Gabon	13.4	13.1	11.4
20	Japan	43.0	42.8	42.3	45	Venezuela	11.1	10.6	10.4
21	Netherlands Antilles	39.1	38.8	38.5	46	Honduras	8.0	8.2	9.4
22	Ukraine	39.7	34.4	37.5	47	Colombia	8.4	8.8	8.8
23	Mexico	32.2	35.0	34.6	48	Haiti	9.9	8.8	8.4
24	Ecuador	33.7	33.3	33.9	49	South Africa	7.6	7.9	7.9
25	Kazakhstan	30.9	31.7	32.4	50	Jamaica	7.9	7.0	7.7

World Meat Consumption Shares – 2009



Source: USDA Foreign Agricultural Service



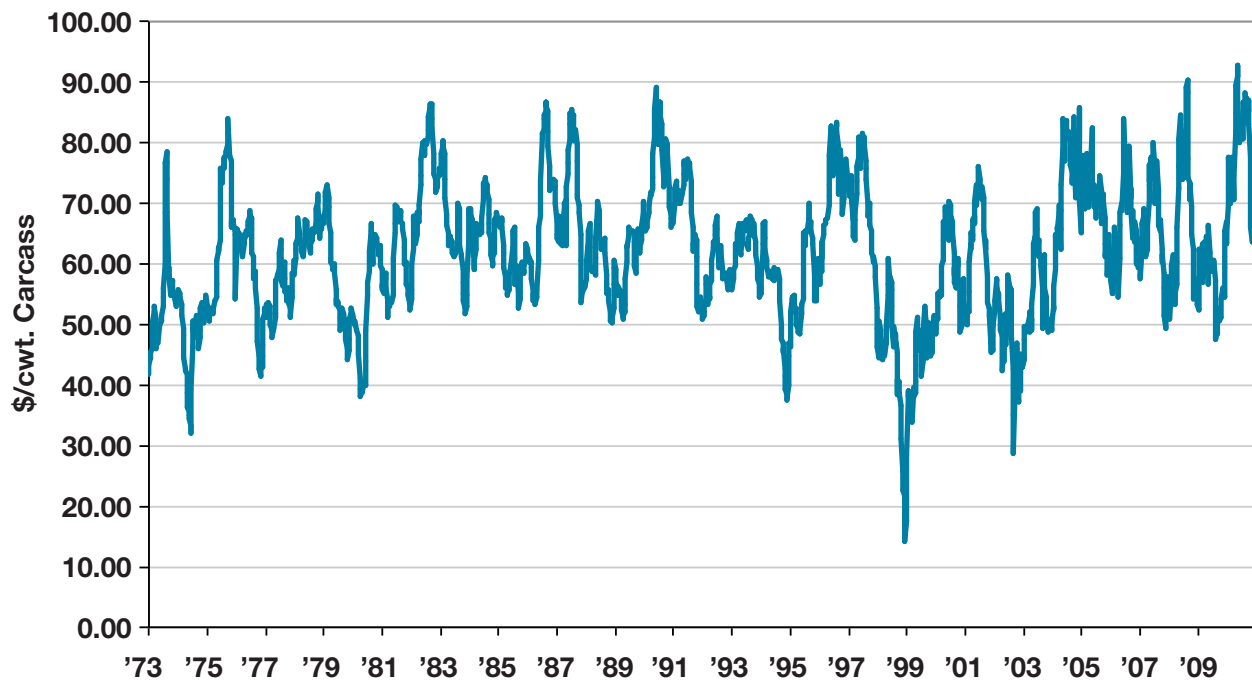
What Determines the Price of Hogs?

Market hog prices in the U.S. are determined by the basic economic forces of supply and demand. The supply of hogs is determined by the price of production inputs and production technology while demand for market hogs is derived from the demand for pork and other products made from the pig.

The interaction of supply and demand results in prices that vary over time. This graph demonstrates all of the forms of price variation – trend, cycle and seasonal. Trends can be seen in the growth of hog prices during the 1970s (largely attributable to increasing meat demand and inflation) and the decline of hog prices during the 1990s, as new technologies and lower grain prices reduced the average cost required to produce pigs. The uptrend of prices from 1998 to present is due to stronger export demand and higher costs, primarily due to higher feed prices driven by ethanol.

Cyclical variation can be seen in the 3- to 4-year period between price peaks and lows. The “hog cycle” is caused by the biological lags inherent in pig production, producers’ need for sufficient resources in order to expand and producers’ natural tendency to try to endure hard times before reducing production.

Iowa-Minnesota Market Hog Prices — Weekly



Source: USDA Agricultural Marketing Service

U.S. Seasonal Pork Price Indexes

U.S. pork production and pig prices vary in a predictable manner during the calendar year. Such variation is called seasonality or seasonal variation. The graph below shows the seasonal indexes for both pork production and market hog prices from 1980 through 2010.

An index shows the percent of the annual average that prevails during a particular month. For example, this graph shows a seasonal production index of 92 percent and a seasonal price index of 110 percent for July. These numbers mean that, on average, July pork production will be about 92 percent of a year's monthly average production, while July pork prices will be about 110 percent of the average annual price.

As "seasonal" implies, weather is a main driver of pork production levels. When considering seasonal factors, one must always consider biological time lags, such as gestation period (about four months for pigs) and feeding period (about six months for pigs).

Breeding performance is better in the cooler weather of fall and winter. This results in more and larger litters being farrowed in spring and early summer and more pigs available for harvest the next fall and winter.

Conversely, higher temperatures cause poorer breeding performance in the spring and summer, resulting in fewer and smaller litters in the fall and winter and fewer market hogs the following spring and summer.

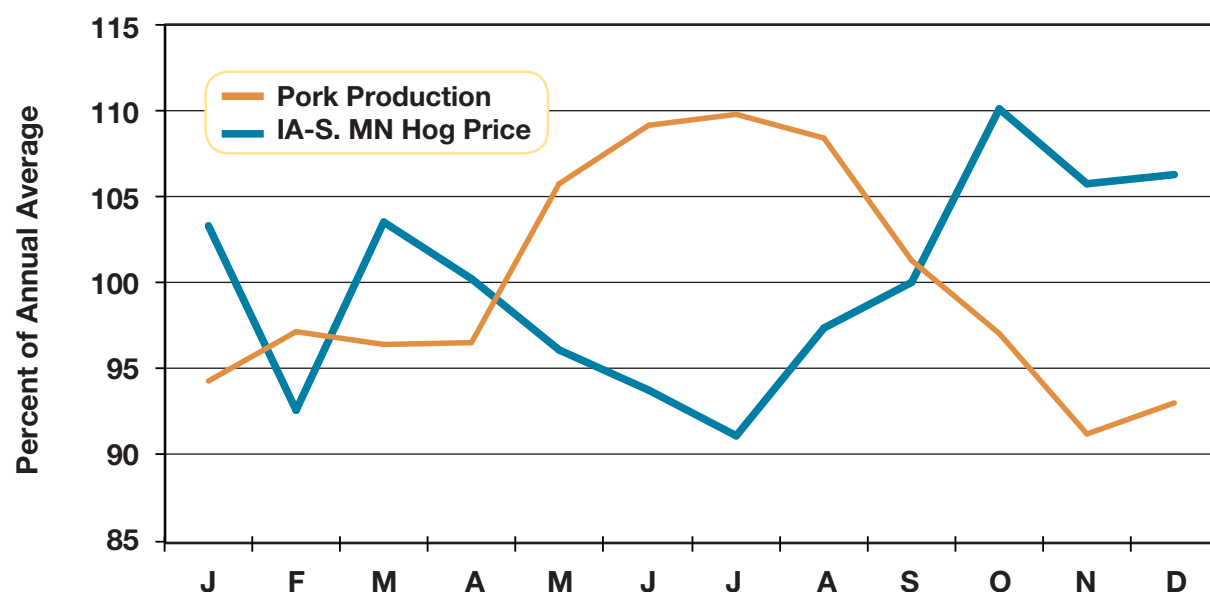
Pig growth rates vary by season, as well, largely because of variations in feed intake. Pigs eat less during hot weather and thus grow slower. This pushes market hogs out of summer months and into the fall. Higher feed intake in cooler months causes pigs to perform exceptionally well and pulls marketings forward in the spring months. Both of these cause fewer pigs to reach market weights during the summer.

Pig prices, quite logically, follow a seasonal pattern opposite of what happens with pork production. But there are seasonal components to pork and hog demand as well.

Summer grilling season increases the demand for loins, ribs, Boston butts and pork trimmings, a major ingredient in hot dogs and other sausages. This strength drives up pork and hog prices. Pork bellies, the raw material from which bacon is made, once contributed greatly to summer-demand strength due to the availability of tomatoes and the popularity of BLTs. Increased year-round use of bacon by foodservice operations has removed much of the seasonal variation in bacon use and belly prices.

Holiday demand for hams causes their prices to vary "counter-seasonally" to hog prices with the year's lowest ham prices being in the summer and highest prices usually occurring in October and November.

Seasonal Hog Supply and Price Indexes – 1980-2010



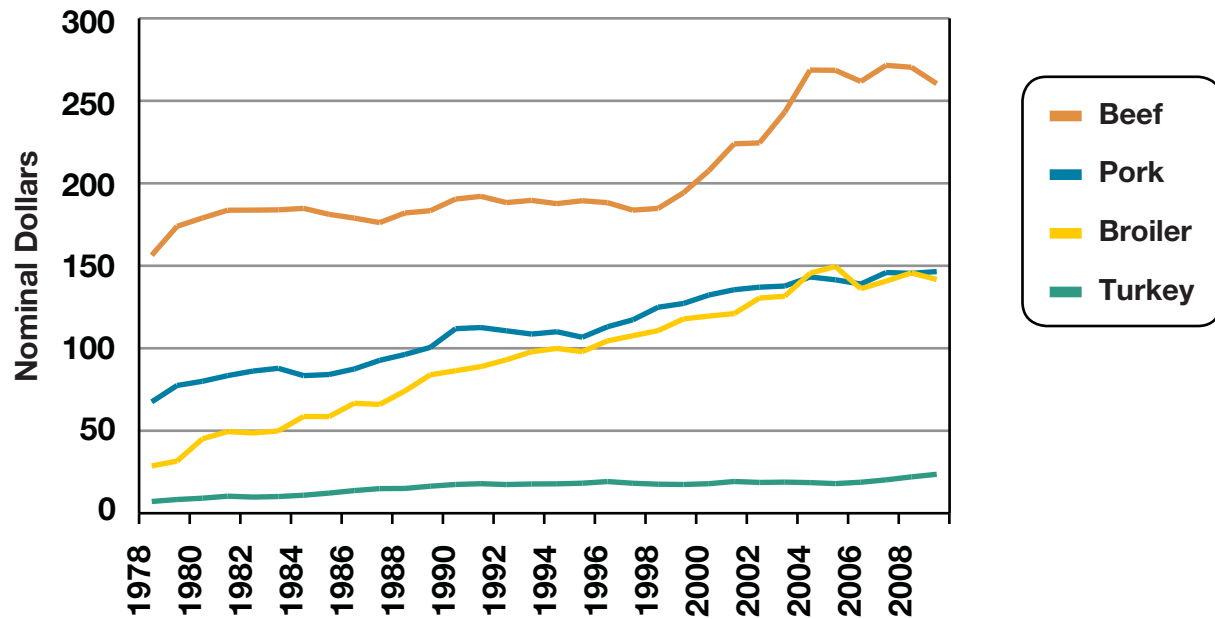
Source: Paragon Economics, Inc.

U.S. Per Capita Meat Consumption

	Retail Weight (pounds)								Boneless Equivalent (pounds)							
	Beef	Pork	Veal	Lamb	Chicken	Turkey	Fish	Total	Beef	Pork	Veal	Lamb	Chicken	Turkey	Fish	Total
1960	63.5	59.1	5.2	4.2	23.5	6.3	10.3	172.1	59.1	48.9	4.2	3.1	16.1	4.9	10.3	146.7
1961	65.5	56.7	4.8	4.5	26.0	7.4	10.7	175.6	61.0	47.1	3.9	3.3	17.8	5.9	10.7	149.6
1962	66.3	57.3	4.6	4.5	26.0	7.1	10.6	176.3	61.8	47.7	3.7	3.4	17.8	5.6	10.6	150.5
1963	70.4	58.4	4.1	4.3	27.2	6.9	10.5	181.7	65.5	48.9	3.4	3.2	18.6	5.5	10.5	155.5
1964	74.8	58.4	4.4	3.7	27.8	7.4	10.5	187.0	70.6	49.2	3.6	2.7	19.0	5.8	10.5	161.5
1965	74.8	51.8	4.4	3.3	29.8	7.5	10.9	182.5	70.6	43.8	3.6	2.4	20.4	6.0	10.9	157.7
1966	78.3	50.7	3.8	3.5	32.1	7.9	10.9	187.3	73.9	43.1	3.2	2.6	21.9	6.3	10.9	161.8
1967	80.1	55.5	3.3	3.4	32.6	8.7	10.6	194.2	75.5	47.4	2.7	2.5	22.3	6.8	10.6	167.9
1968	82.2	56.7	3.1	3.3	32.9	8.1	11.0	197.3	77.6	48.7	2.5	2.4	22.5	6.4	11.0	171.1
1969	82.8	55.0	2.7	3.1	34.9	8.4	11.2	198.0	78.1	47.5	2.3	2.3	24.1	6.6	11.2	171.9
1970	84.7	55.9	2.4	2.9	36.9	8.1	11.7	202.6	79.9	48.6	2.0	2.1	25.4	6.4	11.7	176.1
1971	84.0	60.6	2.2	2.8	36.7	8.4	11.5	206.3	79.2	53.0	1.8	2.1	25.1	6.6	11.5	179.3
1972	85.8	54.7	1.8	2.9	38.5	9.0	12.5	205.2	81.0	48.1	1.5	2.2	26.3	7.1	12.5	178.6
1973	80.8	49.0	1.4	2.4	37.0	8.4	12.7	191.6	76.2	43.4	1.2	1.7	25.2	6.7	12.7	167.0
1974	85.7	52.8	1.9	2.0	36.9	8.7	12.1	200.1	80.8	47.1	1.5	1.5	25.1	6.9	12.1	175.0
1975	88.2	43.0	3.4	1.8	36.7	8.3	12.1	193.5	83.2	38.5	2.8	1.3	25.0	6.5	12.1	169.5
1976	94.6	45.5	3.2	1.6	39.9	8.9	12.9	206.7	89.2	41.1	2.7	1.2	27.1	7.0	12.9	181.2
1977	91.7	47.1	3.1	1.5	40.7	8.8	12.6	205.5	86.5	42.6	2.6	1.1	27.7	6.9	12.6	180.0
1978	87.5	47.0	2.4	1.4	43.1	8.7	13.4	203.5	82.5	42.8	1.9	1.0	29.2	6.9	13.4	177.8
1979	78.2	53.7	1.6	1.3	46.0	9.3	13.0	203.1	73.7	49.1	1.3	1.0	31.7	7.3	13.0	177.2
1980	76.6	57.3	1.5	1.4	45.8	10.3	12.5	205.4	72.3	52.6	1.2	1.0	31.7	8.1	12.5	179.3
1981	78.3	54.7	1.6	1.4	46.9	10.6	12.7	206.1	73.8	50.4	1.3	1.0	32.4	8.4	12.7	180.1
1982	77.1	49.1	1.6	1.5	47.0	10.6	12.5	199.4	72.7	45.3	1.3	1.1	32.6	8.4	12.5	173.9
1983	78.6	51.7	1.6	1.5	47.4	11.0	13.4	205.2	74.1	47.8	1.3	1.1	32.9	8.7	13.4	179.3
1984	78.5	51.5	1.7	1.5	49.2	11.1	14.2	207.7	74.0	47.6	1.4	1.1	34.2	8.7	14.2	181.3
1985	79.3	51.9	1.8	1.4	51.0	11.6	15.1	212.1	74.8	48.1	1.5	1.1	35.4	9.2	15.1	185.1
1986	78.9	49.0	1.8	1.4	52.0	12.9	15.5	211.5	74.6	45.6	1.5	1.0	36.1	10.2	15.5	184.5
1987	73.9	49.2	1.5	1.3	55.1	14.7	16.2	211.9	69.7	46.0	1.2	1.0	38.3	11.6	16.2	184.1
1988	72.7	52.5	1.3	1.4	55.3	15.7	15.2	214.1	68.7	49.2	1.1	1.0	38.6	12.4	15.2	186.3
1989	69.0	52.0	1.2	1.4	56.7	16.6	15.6	212.5	65.3	48.8	1.0	1.0	39.7	13.1	15.6	184.6
1990	67.8	49.7	1.1	1.4	59.5	17.6	15.0	212.1	64.1	46.7	0.9	1.1	41.6	13.9	15.0	183.3
1991	66.6	50.2	1.0	1.4	62.0	17.9	14.9	214.0	63.1	47.2	0.8	1.0	43.4	14.2	14.9	184.6
1992	66.2	52.8	1.0	1.3	65.6	17.9	14.8	219.6	62.7	49.6	0.8	1.0	45.8	14.2	14.8	188.9
1993	64.6	51.9	0.9	1.3	68.0	17.7	15.0	219.5	61.2	48.8	0.8	1.0	47.4	14.0	15.0	188.2
1994	66.3	52.5	0.9	1.2	68.8	17.8	15.2	222.7	63.1	49.3	0.8	0.9	48.1	14.1	15.2	191.4
1995	66.6	51.8	1.0	1.2	68.0	17.8	15.0	221.3	63.7	48.6	0.8	0.9	47.6	14.0	15.0	190.6
1996	67.2	48.4	1.2	1.1	69.4	18.4	14.8	220.4	64.2	45.4	1.0	0.8	48.5	14.5	14.8	189.3
1997	65.7	47.9	1.0	1.1	71.4	17.3	14.6	219.0	62.8	45.0	0.8	0.8	50.1	13.7	14.6	187.7
1998	66.7	51.5	0.8	1.2	72.1	17.7	14.9	224.8	63.8	48.4	0.7	0.9	50.5	14.0	14.9	193.0
1999	67.5	52.7	0.7	1.1	76.3	17.6	15.4	231.4	64.6	49.5	0.6	0.8	53.5	13.9	15.4	198.2
2000	67.7	51.2	0.7	1.1	76.9	17.3	15.2	230.2	64.7	48.1	0.5	0.8	53.9	13.7	15.2	197.0
2001	66.3	50.2	0.6	1.1	76.6	17.5	14.8	227.2	63.3	47.2	0.5	0.8	53.7	13.8	14.8	194.2
2002	67.7	51.5	0.6	1.2	80.5	17.7	15.6	234.8	64.6	48.4	0.5	0.9	56.4	14.0	15.6	200.4
2003	65.0	51.7	0.6	1.1	81.4	17.4	16.3	233.5	61.9	48.6	0.5	0.8	57.1	13.7	16.3	198.9
2004	66.2	51.4	0.5	1.1	84.5	17.1	16.6	237.5	63.3	48.3	0.4	0.8	59.2	13.5	16.6	202.2
2005	65.6	50.1	0.5	1.1	85.9	16.7	16.2	236.1	62.7	47.0	0.4	0.8	60.2	13.2	16.2	200.6
2006	65.8	49.5	0.4	1.1	86.5	17.0	16.5	237.0	63.0	46.5	0.4	0.8	60.7	13.4	16.5	201.3
2007	65.2	50.8	0.4	1.1	85.2	17.6	16.3	236.7	62.4	47.8	0.3	0.8	59.7	13.9	16.3	201.2
2008	62.8	49.5	0.4	1.0	83.4	17.6	16.0	230.7	60.0	46.5	0.3	0.7	58.5	13.9	16.0	195.9

Source: USDA, U.S. Department of Commerce (fish data)

Nominal* U.S. Per Capita Meat Expenditures



	Beef	Pork	Broiler	Turkey
1978	156.38	67.51	28.67	7.13
1979	173.91	77.43	31.62	8.32
1980	178.97	79.97	45.08	9.11
1981	183.69	83.42	49.50	10.33
1982	183.75	86.19	48.62	9.80
1983	183.91	87.84	49.88	10.12
1984	184.80	83.41	58.67	10.91
1985	181.19	84.08	58.57	12.20
1986	178.92	87.44	66.67	13.73
1987	176.18	92.66	65.94	14.92
1988	182.01	96.25	74.11	15.02
1989	183.38	100.53	83.89	16.39
1990	190.44	111.88	86.38	17.44
1991	192.10	112.56	88.87	17.89
1992	188.32	110.60	92.98	17.38
1993	189.64	108.61	97.88	17.73
1994	187.67	110.02	99.90	17.82
1995	189.43	106.67	97.94	18.20
1996	188.25	113.04	104.47	19.20
1997	183.73	117.25	107.59	18.18
1998	184.79	124.87	110.72	17.59
1999	194.27	127.14	117.78	17.43
2000	207.64	132.26	119.52	17.89
2001	223.91	135.48	121.00	19.24
2002	224.48	137.03	130.47	18.66
2003	243.21	137.72	131.56	18.86
2004	268.65	143.22	145.47	18.56
2005	268.51	141.49	149.58	17.96
2006	261.73	138.94	136.09	18.79
2007	271.49	145.91	140.70	20.22
2008	270.35	145.42	145.70	22.04
2009	260.39	146.50	141.69	23.61

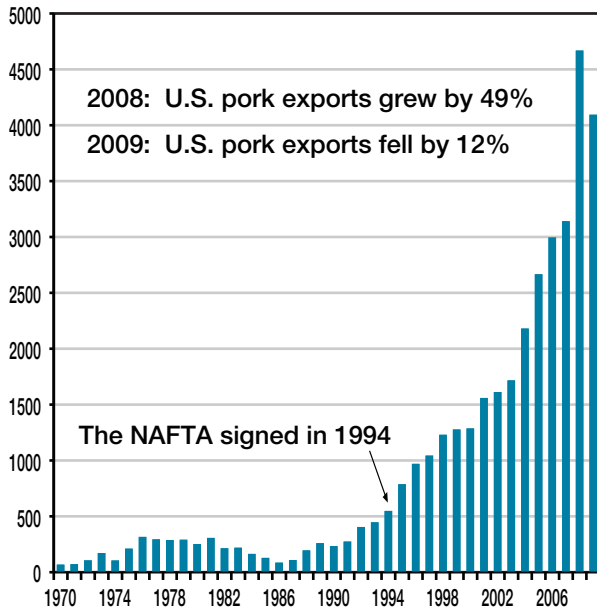
*Not adjusted for inflation

Source: USDA data, Livestock Marketing Information Center



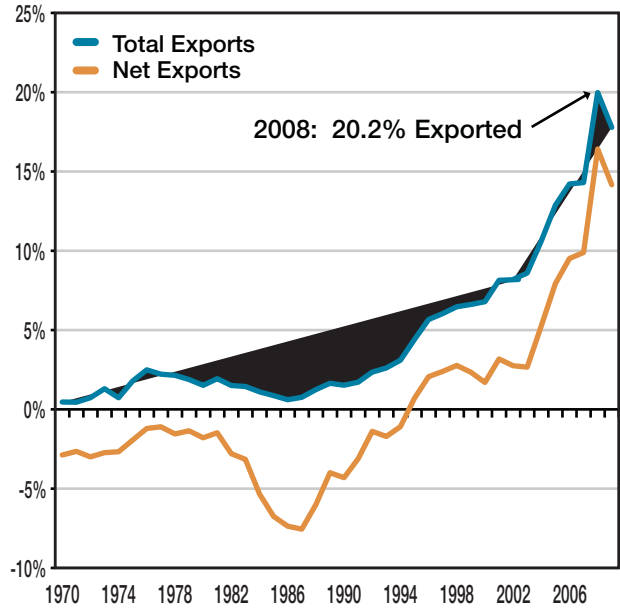
U.S. Pork Exports

Mil. lbs. carcass



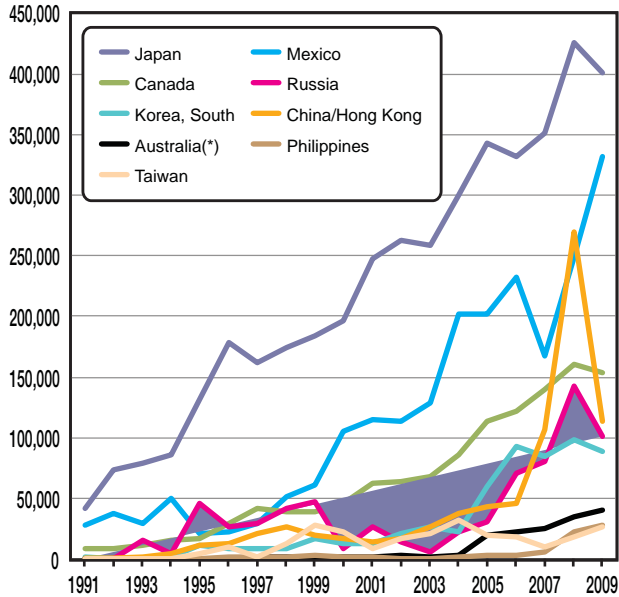
U.S. Total & Net Pork Exports (as a Percent of Production)

Percent



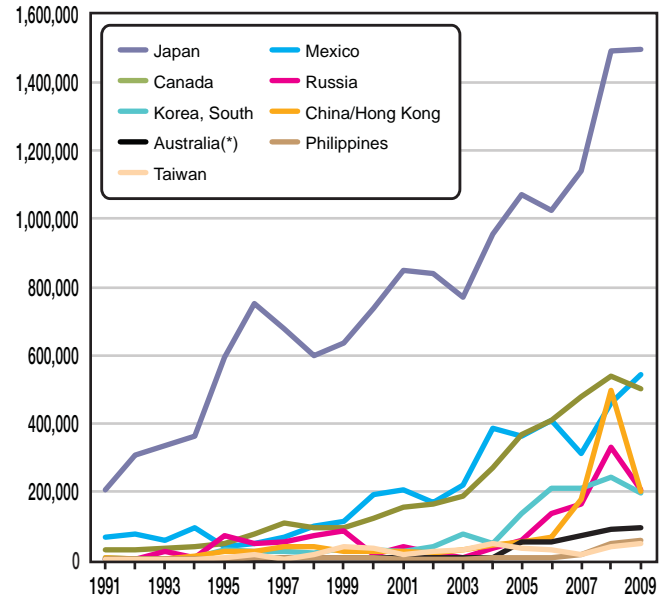
U.S. Pork Export Markets by Volume

Metric tons



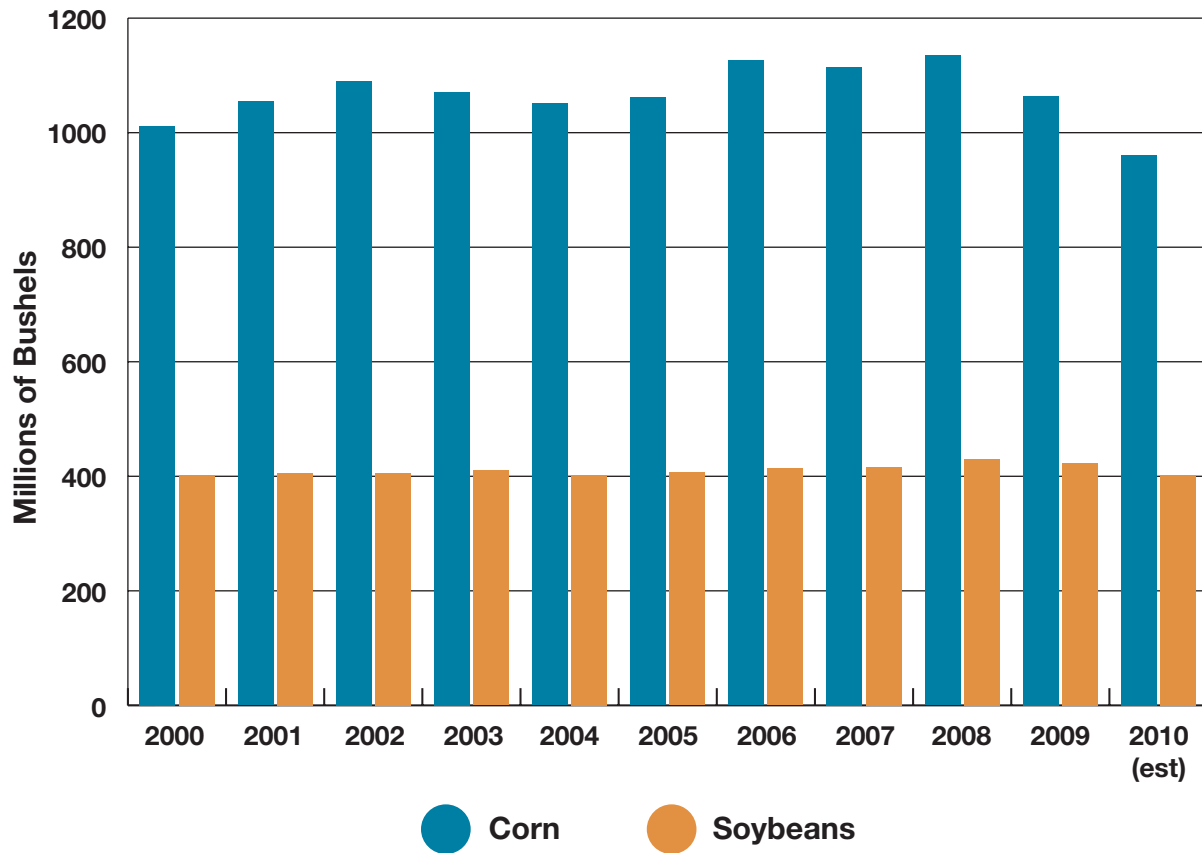
U.S. Pork Export Markets by Value

Million \$



Source: USDA, Economic Research Service

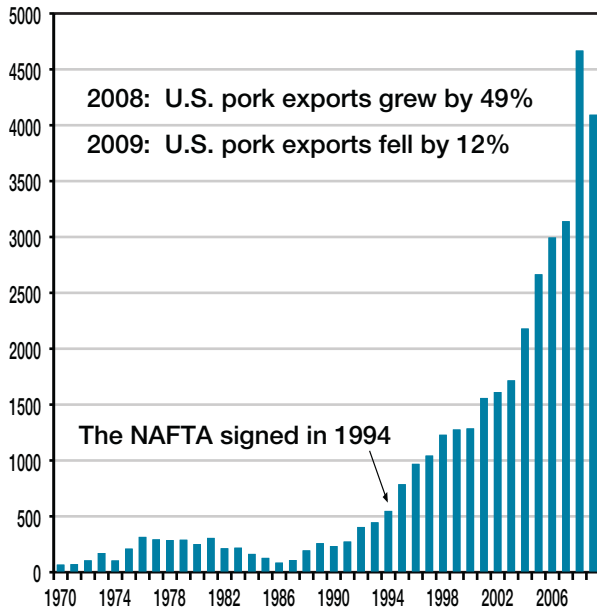
Grain Usage for Pork Production – Total Corn and Soybeans Fed to Hogs



Source: Paragon Economics, Inc.

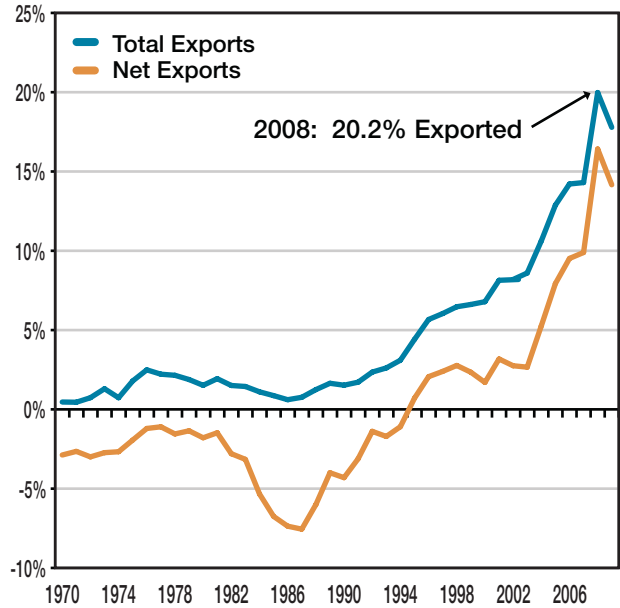
U.S. Pork Exports

Mil. lbs. carcass



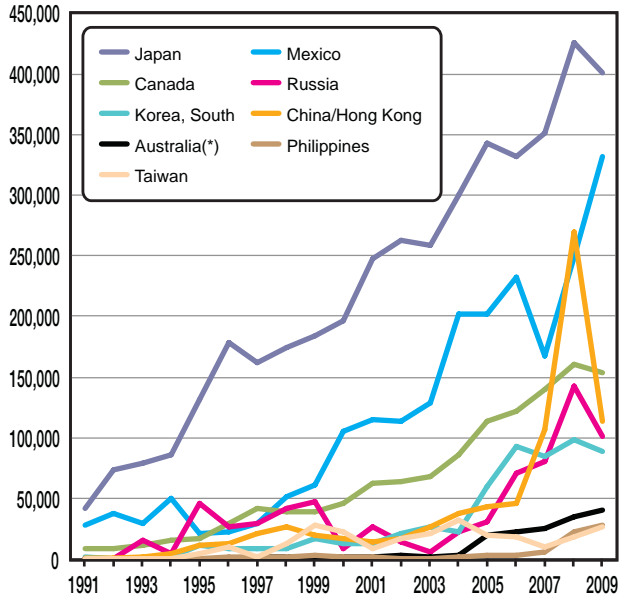
U.S. Total & Net Pork Exports (as a Percent of Production)

Percent



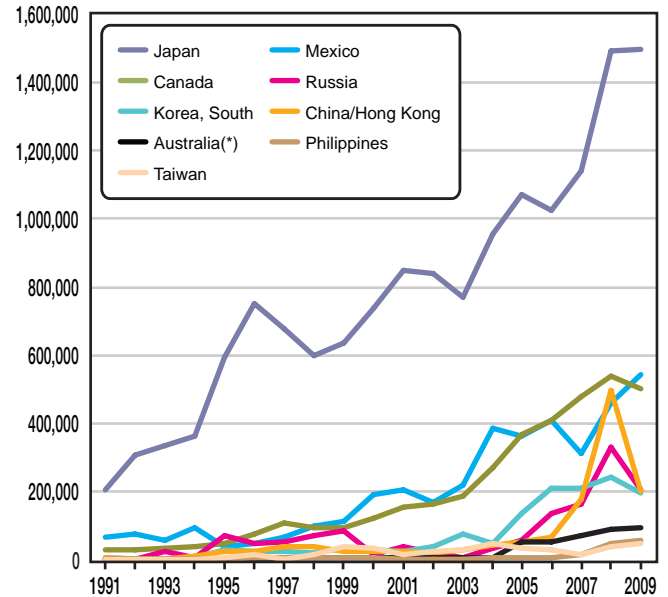
U.S. Pork Export Markets by Volume

Metric tons



U.S. Pork Export Markets by Value

Million \$



Source: USDA, Economic Research Service

U.S. Pork Exports and Net Exports

	Million Lbs., Carcass Weight ¹			Thousand Metric Tons, Product Weight ²		
	Imports	Exports	Net Exports	Imports	Exports	Net Exports
1970	491.0	68.0	-423.0	—	—	—
1971	496.0	72.0	-424.0	—	—	—
1972	538.0	106.0	-432.0	—	—	—
1973	533.0	172.0	-361.0	—	—	—
1974	488.0	105.0	-383.0	—	—	—
1975	439.0	211.0	-228.0	—	—	—
1976	469.1	316.2	-152.9	—	—	—
1977	439.6	293.8	-145.7	—	—	—
1978	495.2	287.7	-207.6	—	—	—
1979	499.4	290.7	-208.8	—	—	—
1980	549.7	251.8	-297.9	—	—	—
1981	541.4	307.0	-234.4	—	—	—
1982	612.1	214.3	-397.8	—	—	—
1983	698.7	219.3	-479.4	—	—	—
1984	953.9	163.9	-790.0	—	—	—
1985	1,127.8	128.4	-999.4	—	—	—
1986	1,121.6	85.7	-1,035.9	—	—	—
1987	1,195.1	109.3	-1,085.8	—	—	—
1988	1,137.2	195.2	-942.0	—	—	—
1989	895.7	268.4	-627.2	346.0	92.8	-253.1
1990	897.9	243.7	-654.1	348.7	82.2	-266.5
1991	774.8	289.8	-485.0	307.5	94.0	-213.5
1992	645.5	419.9	-225.6	258.2	140.3	-117.9
1993	740.2	446.4	-293.8	295.2	148.3	-146.9
1994	743.8	548.5	-195.2	296.7	177.4	-119.3
1995	664.0	787.5	123.5	268.9	263.8	-5.0
1996	619.7	969.9	350.2	251.8	306.5	54.7
1997	634.1	1043.6	409.6	261.3	324.1	62.8
1998	705.4	1230.1	524.7	289.6	399.9	110.3
1999	827.1	1,277.1	450.0	345.9	434.3	88.4
2000	966.6	1,286.7	320.1	410.3	438.1	27.9
2001	950.7	1,559.5	608.7	404.2	528.1	123.8
2002	1,070.7	1,612.2	541.5	454.9	550.0	95.1
2003	1,185.2	1,716.7	531.5	505.3	578.2	72.9
2004	1,099.5	2,180.5	1,081.1	469.4	747.4	278.0
2005	1,023.9	2,666.1	1,642.3	436.6	905.9	469.2
2006	989.7	2,997.3	2,007.7	418.1	1017.6	599.5
2007	968.4	3,141.2	2,172.7	408.8	1052.2	643.5
2008	831.9	4,668.3	3,836.5	350.2	1566.8	1216.6
2009	833.8	4,094.1	3,260.3	356.7	1397.9	1041.2
2010*	—	—	—	373.0	1425.9	1052.9

Source: ¹USDA Economic Research Service, ²USDA Foreign Agricultural Service, *Paragon Economics Forecast



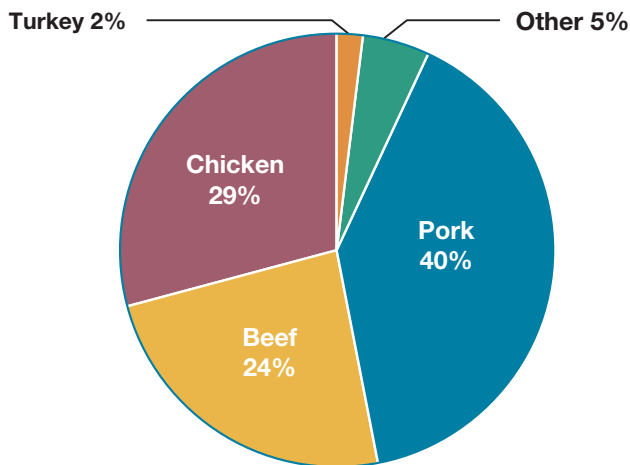
China alone accounts for 50 percent of the world's pork consumption.

World Pork Consumption

World Per Capita Pork Consumption, Lbs., Carcass weight

Rank	Country	2008	2009	2010	Rank	Country	2008	2009	2010
1	Belarus	99.0	92.5	94.0	26	Moldova	34.6	28.7	30.6
2	EU-27	94.3	93.2	92.1	27	Philippines	29.1	29.1	30.4
3	China/Hong Kong	77.7	80.8	82.1	28	Panama	24.7	26.2	29.1
4	Serbia	80.0	76.7	78.7	29	Brazil	26.8	26.9	28.0
5	Taiwan	78.7	81.3	78.5	30	Uruguay	21.6	22.7	25.1
6	Montenegro	91.0	88.6	72.7	31	Dominican Republic	21.3	23.3	24.5
7	Switzerland	73.8	73.4	72.5	32	Macedonia	21.4	22.4	24.5
8	Korea, South	69.2	67.2	69.0	33	Cuba	21.8	22.0	22.5
9	Bahamas, The	43.4	57.3	63.9	34	Trinidad and Tobago	17.9	17.9	19.7
10	United States	63.8	64.6	59.9	35	Korea, North	17.1	16.7	16.8
11	Singapore	53.6	57.3	59.1	36	Albania	13.4	17.6	15.0
12	Croatia	57.3	56.9	58.4	37	Angola	15.3	16.0	14.8
13	Norway	57.5	55.8	55.1	38	Argentina	13.7	13.9	14.3
14	Canada	56.3	56.1	52.0	39	Georgia	17.1	13.8	13.4
15	Chile	45.8	49.0	50.0	40	Armenia	16.3	13.4	13.4
16	Australia	47.8	48.4	48.7	41	Kyrgyzstan	11.0	11.0	11.9
17	Russia	47.9	47.2	48.5	42	Guatemala	11.2	11.7	11.7
18	Vietnam	47.3	46.7	45.8	43	Bosnia & Herzegovina	10.1	10.5	11.4
19	New Zealand	44.9	47.2	45.6	44	Gabon	13.4	13.1	11.4
20	Japan	43.0	42.8	42.3	45	Venezuela	11.1	10.6	10.4
21	Netherlands Antilles	39.1	38.8	38.5	46	Honduras	8.0	8.2	9.4
22	Ukraine	39.7	34.4	37.5	47	Colombia	8.4	8.8	8.8
23	Mexico	32.2	35.0	34.6	48	Haiti	9.9	8.8	8.4
24	Ecuador	33.7	33.3	33.9	49	South Africa	7.6	7.9	7.9
25	Kazakhstan	30.9	31.7	32.4	50	Jamaica	7.9	7.0	7.7

World Meat Consumption Shares – 2009



Source: USDA Foreign Agricultural Service

Top 20 Markets for U.S. Pork Exports 2009 (Ranked by Quantity)

Pork Exports, Product Weight

		Quantity Metric Tons	Value \$1,000
1	Japan	400,456.4	1,498,630
2	Mexico	331,703.7	541,801
3	Canada	154,145.7	500,956
4	Russia	100,809.8	205,551
5	Hong Kong	96,218.4	176,295
6	Korea, South	88,545.2	194,438
7	Australia	40,566.7	91,965
8	Philippines	28,763.6	58,425
9	Taiwan	27,397.3	47,462
10	China	16,943.2	24,945
11	Honduras	15,934.5	28,695
12	Dominican Republic	15,472.6	30,178
13	Guatemala	6,480.2	13,677
14	Singapore	6,137.3	13,884
15	New Zealand	5,839.6	12,562
16	Cuba	5,602.1	10,636
17	United Kingdom	4,924.1	16,347
18	Bahamas, The	4,535.2	10,201
19	Ukraine	4,252.1	6,180
20	Colombia	4,203.2	8,197

Source: Department of Commerce, U.S. Census Bureau, Foreign Trade Statistics

Pork Variety Meat Exports, Product Weight

		Quantity Metric Tons	Value \$1,000
1	Mexico	175,930	158,657.2
2	Hong Kong	130,620	108,359.1
3	Russia	49,114	28,610.2
4	Japan	32,536	20,130.9
5	China	19,169	17,370.8
6	Taiwan	17,951	14,943.1
7	Korea, South	19,169	14,908.2
8	Canada	11,414	13,813.2
9	Philippines	16,167	12,995.2
10	Australia	15,027	7,158.1
11	Vietnam	4,865	4,156.2
12	Dominican Republic	3,728	3,312.9
13	Haiti	2,491	2,874.3
14	Singapore	2,839	1,904.8
15	Colombia	2,580	1,777.0
16	New Zealand	2,482	1,265.6
17	Honduras	1,031	956.8
18	Guatemala	1,193	889.7
19	Ukraine	1,014	806.8
20	Chile	1,163	734.5

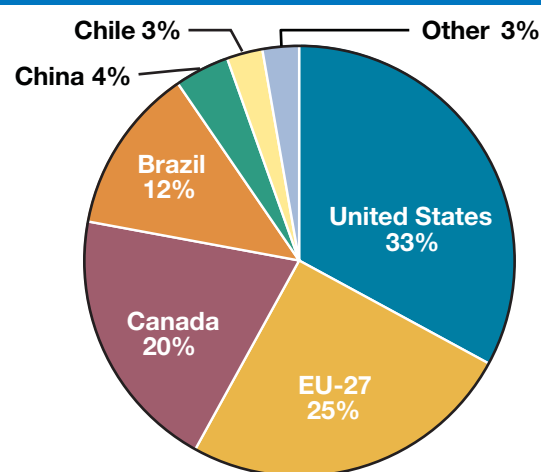
Source: Department of Commerce, U.S. Census Bureau, Foreign Trade Statistics

Top 10 Pork-Producing Countries

		Thousand Metric Tons	
		2009	2010*
1	China	48,905	50,000
2	EU-27	22,159	22,250
3	United States	10,442	10,052
4	Brazil	3,130	3,170
5	Russia	2,205	2,270
6	Vietnam	1,850	1,870
7	Canada	1,789	1,750
8	Japan	1,310	1,280
9	Philippines	1,240	1,255
10	Mexico	1,162	1,161
	Other	6,281	6,449

Source: USDA Foreign Agricultural Service, *2010 data are FAS forecast

World Pork Export Shares – 2009



The importance of Exports to Producers

Exports are critically important to producers. In 2009, the equivalent of **one of every five hogs produced in the United States was exported**. The value of pork and pork variety meat exports amounted to \$36.10 per head for each hog harvested in the U.S. in 2009.



Canadian Hog/Pork Exports

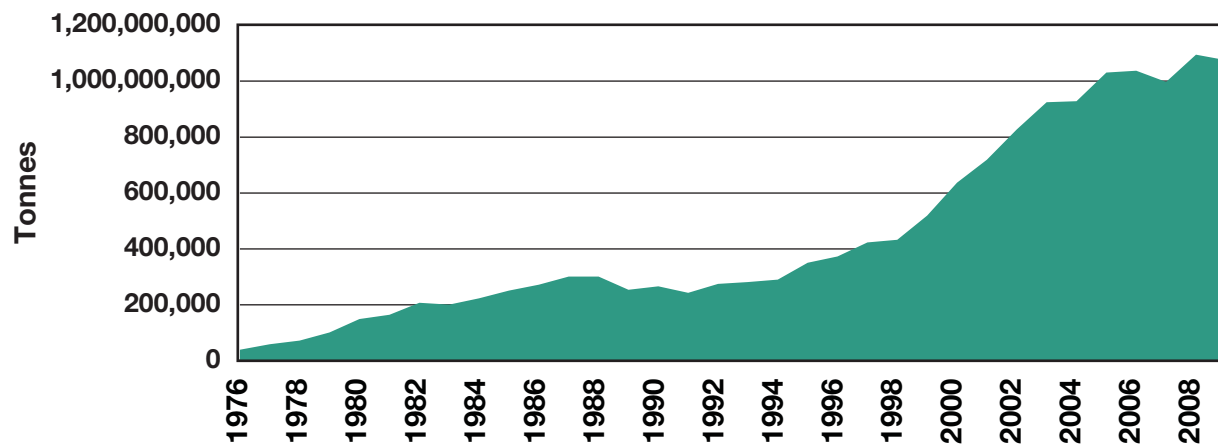
	Live Exports ¹ (<50 kg head)	Live Exports ¹ (> 50 kg head)	Exports of Live Pigs ² (head)	Total Pigs	Pork Exports ¹ (tonnes ³)
1976			44,984		39,350
1977			43,347	43,347	59,456
1978			187,966	187,966	72,139
1979			131,192	131,192	101,612
1980			237,590	237,590	149,277
1981			147,344	147,344	164,354
1982			305,294	305,294	207,898
1983			459,303	459,303	201,205
1984			1,346,472	1,346,472	223,869
1985			1,152,442	1,152,442	250,806
1986			512,183	512,183	271,898
1987			427,591	427,591	301,086
1988	146,963	716,588		863,551	301,156
1989	170,568	835,140		1,005,708	253,946
1990	204,985	684,903		889,888	266,159
1991	225,856	837,781		1,063,637	243,001
1992	226,308	443,861		670,169	275,240
1993	280,813	556,611		837,424	281,934
1994	401,541	513,002		914,543	290,414
1995	650,748	1,096,003		1,746,751	350,565
1996	766,974	2,010,864		2,777,838	373,376
1997	987,287	2,188,633		3,175,920	423,242
1998	1,466,077	2,655,872		4,121,949	433,023
1999	2,083,426	2,052,625		4,136,051	519,587
2000	2,335,848	2,018,517		4,354,365	636,646
2001	3,168,770	2,152,298		5,321,068	718,703
2002	3,757,366	1,966,268		5,723,634	827,379
2003	4,974,044	2,458,173		7,432,217	924,344
2004	5,623,494	2,881,478		8,504,972	928,382
2005	5,416,249	2,774,218		8,190,467	1,030,522
2006	6,013,546	2,749,832		8,763,378	1,037,267
2007	6,720,515	3,283,802		10,004,317	996,985
2008	7,036,493	2,311,411		9,347,904	1,094,499
2009	5,221,439	1,143,114		6,364,553	1,075,181

1 Source: Statistics Canada Red Meat Section, Agriculture and Agri-Food Canada

2 Breakdown of exports by > or < 50 kg not available prior to 1988

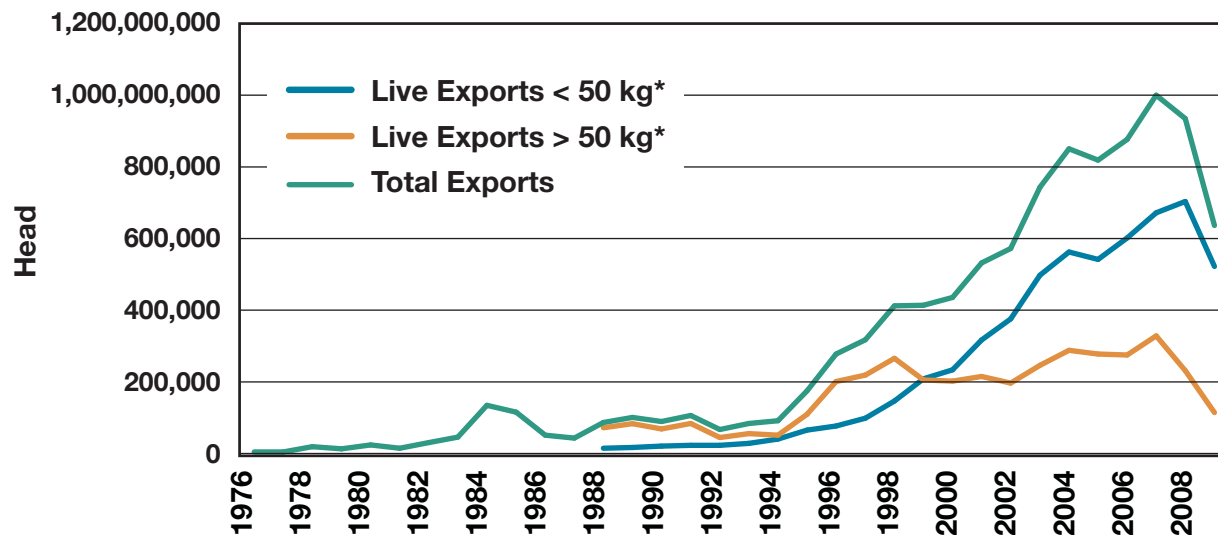
3 1976-1987 weight of exports is on a dressed carcass basis, whereas 1988 onward is an actual shipped weight

Canadian Pork Exports – Dressed Carcass Basis



Source: Statistics Canada

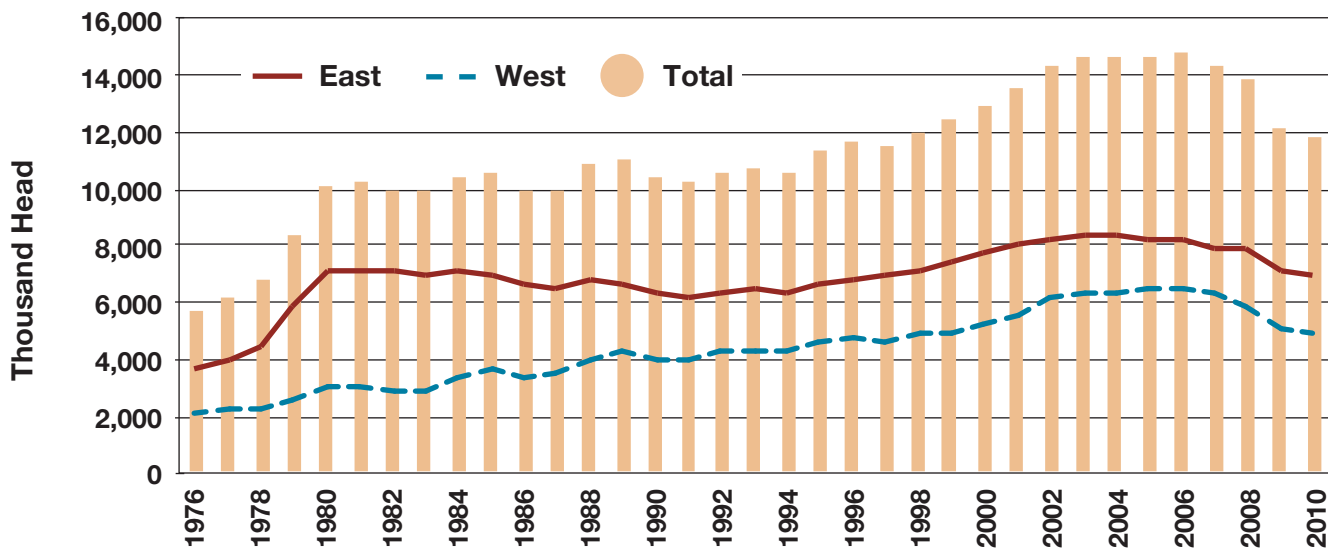
Canadian Live Hog Exports



Source: Statistics Canada

* No data before 1988

Canadian Hog Inventory (January 1 of each year)



Source: Statistics Canada

Canada has long had a vibrant pork industry that has for many years depended heavily on exports. With a population of only 32.6 million people who now eat just slightly less pork per capita than their U.S. neighbors, Canada has a domestic market for only about 1.9 billion pounds of carcass-weight pork per year. In 2009, Canada produced a record 4.30 billion pounds, carcass-weight, and exported 2.37 billion pounds, slightly less than 2008's record exports of 2.41 billion pounds.

Canada also exported 6.4 million live hogs to the United States for feeding and/or harvest in 2009. Of the 6.4 million head, 5.22 million were feeder pigs (about 45 lbs.) or weaned pigs (10 to 12 lbs.) that were subsequently fed to market weight in the United States. The other 1.14 million head were market-weight hogs or culled sows and boars headed for U.S. packing plants.

Canada's pork industry grew rapidly from 1995 to 2004. It's breeding herd grew by over 50 percent, litters farrowed (born) grew by 70 percent and pigs born grew by 83 percent. The larger numbers for farrowings (births) and pigs born indicate a dramatic increase in productivity.

This growth was driven by two major developments. First, the repeal of transportation subsidies on grain shipments from the Prairie Provinces (Saskatchewan, Manitoba and Alberta) to the Pacific Coast, Ontario and Quebec drove grain prices lower in the prairies and encouraged livestock production. Due to supply controls, neither the dairy nor poultry sectors could grow, so the pork and, to a lesser degree, beef sectors took advantage of this opportunity.

Also, the Canadian dollar lost substantial value from 1997 through 2001. Canadian hog prices are simply U.S. hog prices converted into Canadian dollars. So, when the Canadian dollar loses value relative to the U.S. dollar, Canadian producers see more Canadian dollars when they sell pigs – regardless

of whether that sale is to a packing plant in the U.S. or one in Canada.

About half of Canadian pork producers' production costs (primarily feed) rose due to the cheaper Canadian dollar. The weaker dollar thus caused all revenue to rise but only about half of costs to rise, meaning Canadian producers saw higher profits as the Canadian dollar weakened. They responded quite logically by increasing the breeding herd and output.

But conditions have changed dramatically since 2002. The Canadian dollar has strengthened by as much as 70 percent, reaching a high of \$1.07U.S. per \$Canada in May of 2007 and spending much of 2010 near par with the U.S. dollar. This increase reduced 100 percent of Canadian producers' income while reducing only about 50 percent of their costs – thus driving profits lower. Canadian producers have also had to deal with the same higher grain and oilseed prices that have plagued U.S. producers since late 2006.

Canada's breeding herd shrunk 17 percent from 1.634 million head in January 2005 to 1.298 million head in October 2010. Many observers believe it will eventually decline to less than 1.2 million head. Canada's contribution to U.S. hog supplies has declined, as well. After a peak of 10.04 million head in 2007, imports of pigs from Canada fell to 9.35 million in 2008 and 6.4 million in 2009.

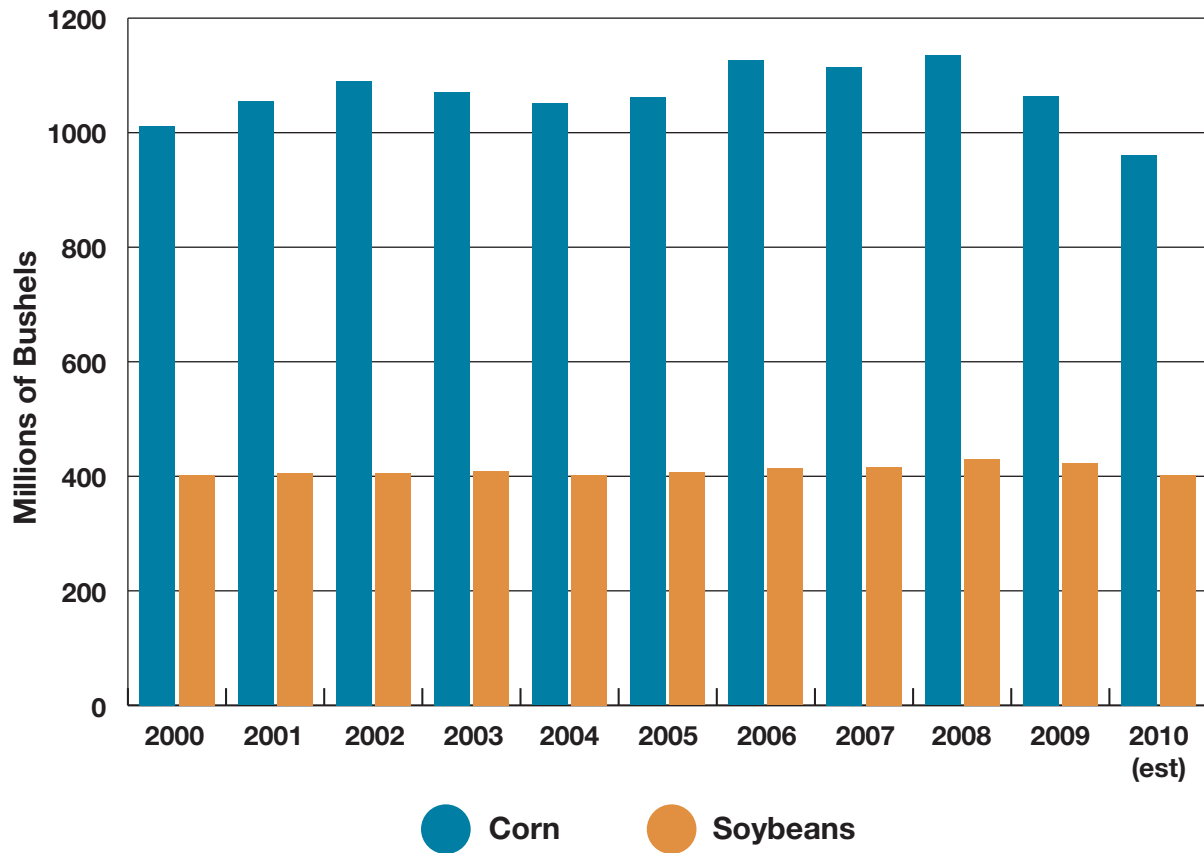
The reduction in imports of Canadian pigs has been exacerbated by the U.S. mandatory country-of-origin labeling law that went into effect in September 2008. The law made handling pork from pigs that were either born in Canada and fed in the U.S. or born and fed in Canada more expensive and troublesome for U.S. packers, processors and retailers. Some now refuse to buy pigs that originate in Canada in order to simplify product inventory and flow systems.

Canadian Hog/Pork Production

Year	Pork Production ¹ (tonnes)	Hog Slaughter ¹ (# head)	Hog Slaughter ¹ (million head)	Sow Herd ¹ Jan 1 '000 (head)	Farrowings ¹ (number)	Pigs Born ¹ (number)
1976	643,187	8,969.2	8.969	562.6	579.0	5,271.6
1977	625,980	9,037.3	9.037	627.2	1,220.0	11,042.8
1978	721,900	9,939.5	9.940	733.1	1,486.5	13,496.0
1979	880,840	12,000.8	12.001	911.5	1,796.0	16,329.7
1980	1,023,780	13,977.5	13.978	1,075.9	1,842.4	16,841.8
1981	1,015,170	13,691.9	13.692	1,071.4	1,798.0	16,285.0
1982	1,005,920	13,458.1	13.458	1,025.6	1,798.3	16,144.9
1983	1,029,610	13,702.5	13.703	1,037.3	1,887.3	17,054.0
1984	1,043,770	13,886.0	13.886	1,087.1	1,961.0	17,701.9
1985	1,088,420	14,452.0	14.452	1,068.8	1,916.9	17,441.9
1986	1,093,920	14,398.7	14.399	1,010.3	1,938.0	17,659.9
1987	1,121,800	14,734.6	14.735	1,020.0	2,064.2	18,842.2
1988	1,181,620	15,438.5	15.439	1,080.4	2,114.6	19,324.8
1989	1,177,150	15,438.8	15.439	1,076.7	2,057.3	18,818.2
1990	1,123,850	14,682.9	14.683	1,020.6	1,986.5	18,078.8
1991	1,096,230	14,323.1	14.323	1,020.0	2,004.7	18,539.7
1992	1,207,700	15,468.3	15.468	1,057.7	2,002.2	18,975.4
1993	1,194,320	15,202.5	15.203	1,079.1	1,914.2	18,386.5
1994	1,229,380	15,475.7	15.476	1,059.1	2,045.7	19,837.8
1995	1,275,760	15,771.2	15.771	1,128.3	2,113.4	20,665.7
1996	1,227,760	15,177.9	15.178	1,091.3	2,104.9	20,726.6
1997	1,256,700	15,384.6	15.385	1,136.4	2,226.3	22,089.0
1998	1,393,610	16,942.5	16.943	1,229.0	2,480.7	24,763.1
1999	1,563,870	18,921.1	18.921	1,250.1	2,669.4	27,022.0
2000	1,639,980	19,684.4	19.684	1,296.5	2,766.6	28,369.8
2001	1,731,130	20,701.8	20.702	1,360.5	2,996.4	30,837.8
2002	1,857,180	22,139.9	22.140	1,468.0	3,147.6	32,484.9
2003	1,880,740	22,444.4	22.444	1,526.7	3,314.3	34,392.4
2004	1,934,740	22,872.2	22.872	1,576.1	3,482.6	36,387.6
2005	1,918,460	22,158.9	22.159	1,597.1	3,434.8	36,231.2
2006	1,899,660	21,619.6	21.620	1,570.1	3,329.7	35,433.4
2007	1,906,720	21,078.3	21.078	1,545.1	3,257.4	34,891.6
2008	1,947,830	21,534.4	21.534	1,482.5	3,158.8	33,953.4
2009	1,945,200	21,639.1	21.639	1,371.2	2,950.4	31,903.3
2010				1,332.0		

¹ Source: Statistics Canada

Grain Usage for Pork Production – Total Corn and Soybeans Fed to Hogs from 2000–2010



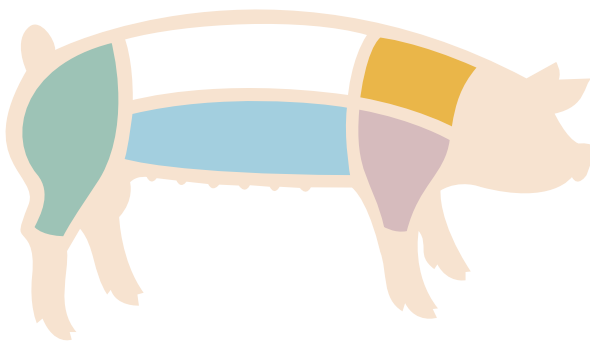
Source: Paragon Economics, Inc.

Typical Market Pig Today

Typical Market Pig

Live weight (pounds).....	265.0
Carcass weight (pounds).....	200.0
Backfat, 10th rib (inches).....	0.7
Loin-eye area (square inches).....	6.6
Fat-free lean (percent.)	54.0
Pounds of lean meat	108.0

A 265 lb. Live Pig...



Produces a 200 lb. Carcass

Carcass Breakdown

	Retail Pork*	Other Products	Carcass Total
Ham (50.7 lbs.)			
Cured ham	28.5		
Fresh ham	2.3		
Trimming	5.8		
Skin, fat, bone		14.1	
Total	36.6	14.1	50.7
Loin (46.0 lbs.)			
Backribs	3.5		
Boneless loin	16.0		
Sirloin roast	6.2		
Tenderloin	2.0		
Trimming	13.0		
Fat and bone		5.3	
Total	40.7	5.3	46.0
Side (28.1 lbs.)			
Cured bacon	15.4		
Spare ribs	7.6		
Trimming	4.1		
Fat		1.0	
Total	27.1	1.0	28.1
Boston Butt (21.4 lbs.)			
Blade steaks	5.9		
Blade roast	10.5		
Trimming	2.1		
Fat		2.9	
Total	18.5	2.9	21.4
Picnic (21.6 lbs.)			
Boneless picnic meat	15.5		
Skin, fat, bone		6.1	
Total	15.5	6.1	21.6
Miscellaneous (32.2 lbs.)			
Jowls, feet, tail, neckbones, etc	12.6		
Fat, skin, bone		17.6	
Shrink and loss		2.0	
Total	12.6	19.6	32.2
Total	151.0	49.0	200.0

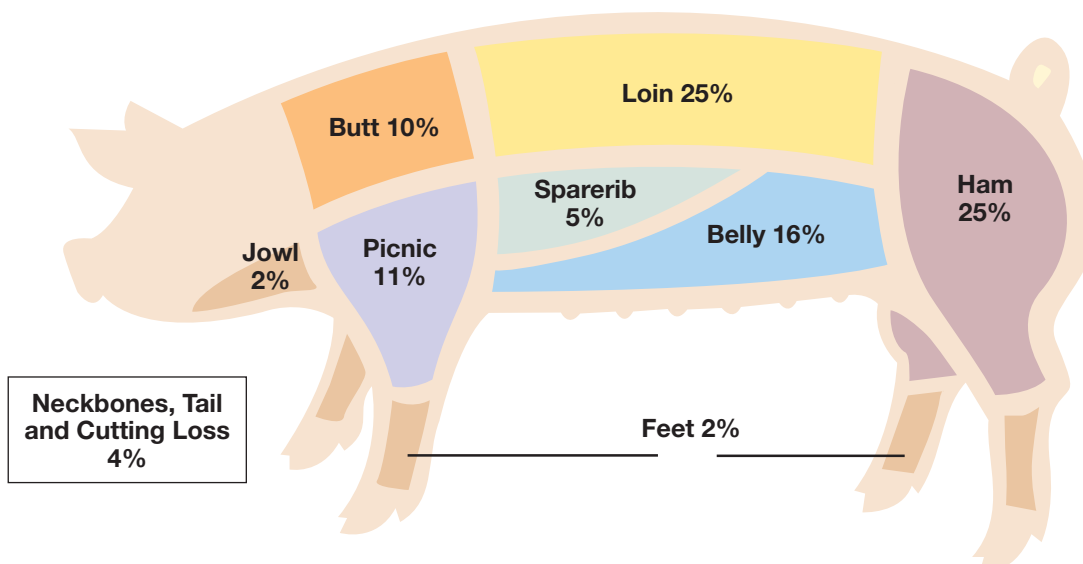
* Retail cuts on semi-boneless basis. Fully boneless would show lower retail weights.

Source: National Pork Board

Figures are averages taken from actual cutting tests. Carcass data vary, depending on cutting method and type of pig.

Wholesale USDA Prices for Pork Sub-primals

Cut	Description	2009 Annual Average (dollars per pound)	2010 Annual Average (dollars per pound)	Year-to-Year Percent Change
Butt Primal, various styles – 10% of carcass	1/4" trimmed butt, 5-10 lbs.	0.73	0.94	29%
	1/4" trimmed steak ready butt	0.82	0.99	21%
	1/8" trimmed steak ready butt	0.89	1.09	22%
Loin Primal, various styles – 25% of carcass	1/4" trimmed Loin, under 21 lbs.	0.93	1.16	25%
	1/8" trimmed Loin, under 21 lbs.	1.03	1.25	22%
	Loins, bone-in, center-cut, tender in	1.29	1.56	21%
	Boneless loin, center-cut, strap on	1.23	1.54	26%
	Boneless loin, center-cut, strap off	1.38	1.68	21%
	Boneless sirloin, 0.75-1.5 lbs.	0.99	1.17	18%
	Tenderloin, under 1.25 lbs.	2.23	2.38	7%
	Loin Backrib, boxed, 2.00 lbs. and over	2.49	2.52	1%
Ham Primal, various styles – 25% of carcass	Bone-in ham, trimmed, 17-20 lbs.	0.53	0.75	41%
	Bone-in ham, trimmed, 20-23 lbs.	0.52	0.78	50%
	Bone-in ham, trimmed, 23-27 lbs.	0.51	0.76	49%
	Boneless ham, 4 muscle	0.97	1.34	37%
	Boneless ham, 5 muscle	0.94	1.30	37%
Picnic Primal, various styles – 11% of carcass	Smoker trim picnic, combo box	0.47	0.70	48%
	Boneless picnic meat, 72%, fresh	0.54	0.85	56%
	Picnic cushion meat, 92%, combo	0.89	1.14	28%
Trim Primal, various styles – 10-30% of carcass	42% lean pork trim, fresh	0.27	0.47	78%
	72% pork trim, fresh	0.43	0.78	82%
Spareribs Primal, various styles – 5% of carcass	3 bag/3 Pcvac 4.25 lbs. and under	1.03	1.34	31%
	3 bag combos, 4.25 lbs. and under	0.93	1.29	39%
	2 bag/3 Pcvac over 4.25 lbs.	1.03	1.28	25%
Belly Primal, various styles – 16% of carcass	Pork belly, skin-on, trimmed, 12-14 lbs.	0.71	1.21	69%
	Pork belly, skin-on, trimmed, 14-16 lbs.	0.74	1.14	55%
	Pork belly, skin-on, trimmed, 16-18 lbs.	0.69	1.13	64%



Note: Primal yields include trim, fat, skin, bone, shrink. Total yields do not calculate to 100% due to other products derived from carcass (jowl, neckbones, tail, feet, cutting loss). Trim yield is approximate due to various styles of cutting primals.

Source: Steiner Consulting Group.

Glossary

Agronomy – branch of agriculture dealing with crop production and soil management

AI – artificial insemination; mechanical insertion of semen into the female's reproduction tract

All-in/all-out production – production system where animals are moved in and out of facilities in distinct groups to help reduce the spread of disease; facilities are normally cleaned and disinfected thoroughly between groups

Animal welfare – The American Veterinary Medical Association (AVMA) has defined animal welfare as “a human responsibility that encompasses all aspects of animal well-being, including proper housing, management, nutrition, disease prevention and treatment, responsible care, human handling and, when necessary, humane euthanasia.”

Antibiotic – a chemical substance produced by a microorganism that has the capacity to inhibit the growth of or to kill other microorganisms

Antimicrobial – an agent that kills bacteria or suppresses their multiplication or growth; includes antibiotics and synthetic agents

Aquifer – layer of permeable rock, sand or gravel that contains or conducts groundwater indicator of the overall fat content of the animal; used in selecting breeding stock and in grading carcasses

Barrow – a male hog that has been castrated

Balanced diet – feed that has all the nutrients an animal needs to stay healthy and grow normally

Belly – lower side of a hog remaining after the loin and spareribs are removed; used to make bacon

Biosecurity program – a program to help prevent diseases from being spread between herds; the program isolates animals, controls human traffic in and around the operation and includes facilities sanitation

Boar – intact male pig; used for breeding

Boston butt – upper part of the pork shoulder

Breeding herd – boars and females in gestation, breeding and farrowing stages of production



CAFO – confined animal feed operation

Carbon cycle – the movement of carbon between its main reservoirs (atmosphere, ground surface, including fresh surface water, ocean and sediments)

Carbon footprint – a measure of an entity's impact on the environment in terms of the amount of greenhouse gas emissions it produces; usually measured in units of carbon dioxide.

Carcass – the two sides of the same processed animal

Case-ready – meat that is pre-packaged by the processor for immediate display in the meatcase

Cold storage – the system whereby meat is stored under refrigeration or in the frozen state for a period of time to provide flexibility in the marketing of various products; not intended to take the heat out of products but rather maintain their previous cold state achieved before entering the facility. Stocks of various products in cold storage may fluctuate during the year depending upon the supply and demand for that product. For instance, hams are collected in cold storage throughout the fall in anticipation of the huge demand for hams during the Christmas season.

Confinement – modern hog facility where hogs are raised indoors

Conservation plan – a combination of land uses and practices to protect and improve soil productivity and to prevent soil deterioration

Consumption – the total amount of a product consumed. Note: No direct measurement of meat consumption is available, so for pork and other meats, consumption is assumed to equal other disappearance.

Contract production – a business model in which one or more phases of the pig production enterprise is performed by a person or company (a “grower”) that does not own the pigs; growers provide land, buildings, labor, utilities and waste management services in return for a per pig or per pig space fee

Conventional buildings – totally enclosed housing facility where the environment (temperature, humidity and lighting) and manure disposal is typically automated; automated heating, cooling and ventilation equipment is used to ensure the pig’s health and access to feed and water

Cross-fostering – the practice of placing piglets from mothers with too many piglets to feed adequately to mothers with extra udder space; done preferably within the first hours after birth after piglets have consumed colostrum

Crude protein – chemically analyzed protein content in a given feed

Cut-out value – the weighted average value of all wholesale cuts in a pig carcass

Demand – the quantities of a good consumers are willing and able to purchase at alternative prices

Deep pit – pit under a hog barn used to temporarily store manure; typically below a slotted floor

Disappearance, other – the amount of production that cannot be accounted for by uses where the quantity is known

For pork, other disappearance is determined by:

Beginning inventory (a known quantity, USDA Cold Storage Report)
+ **Production** (a known quantity, USDA Livestock Slaughter)
+ **Imports** (a known quantity, U.S. Department of Commerce and USDA FAS)

= **Total supply**

- **Exports** (a known quantity, U.S. Department of Commerce and USDA FAS)
- **Ending inventory** (a known quantity, USDA Cold Storage Report)

= **Other Disappearance**

Effluent – the liquid layer of manure after solids have settled out, such as in a lagoon

Estrus – period during which a gilt or sow is receptive to mating and during which ovulation occurs

Estrous female – a gilt or sow in estrus

Euthanasia – the humane death of an animal occurring without pain or distress

Farrow – to give birth to piglets

Farrowing – the process of birthing for swine



Farrow-to-finish operation – a production system that contains all production phases, from breeding to gestation to farrowing to nursery to grow-finishing to market

Feed efficiency (or feed conversion ratio) – the amount of feed a pig consumes to gain one unit of body weight; the smaller the amount, the more efficient the pig

Feeder pig – a young pig weighing 30 and 90 pounds

Feeder pig operation – a production system where pigs are sold out of the nursery phase to a finishing operation to grow them to market weight

Finish – to feed a pig until it reaches market weight

Finisher pig – a pig that is beyond the feeder stage being raised for sale

Finishing operation – an operation that purchases feeder pigs and feeds them to market weight

Gestation – pregnancy; 112-114 days in length for pigs

Gilt – young female that has not farrowed her first litter

Greenhouse gases (GHG) – Gases that accumulate infrared radiation in the atmosphere resulting in climate change. Some result from natural processes while others are generated only through human activities.

Greenhouse gas emissions – A term that describes greenhouse gases emitted into the atmosphere by an activity, a process, an individual or an organization. Also known as carbon emissions.

Grower pig – a young pig weighing between about 50 and 200 pounds

Ham – cured and smoked meat from the hind leg of pork, excluding the shank

Hand mating – an individual female that is ready to be bred is exposed to an individual boar in a small pen for mating, under the supervision of the producer

Harvest – the process of animals being harvested for food usage. There are two measures in the U.S. Federally inspected (FI) slaughter is the number of animals harvested in plants that are subject to inspection by USDA Food Safety Inspection Service. Commercial slaughter/ harvest includes FI slaughter and the harvest that occurs in state-inspected facilities

Hoop structure – low-cost, uninsulated and naturally ventilated hoop-shaped production building; the floor is usually earthen and typically bedded with straw or cornstalk

Immunization – the process of rendering a subject immune or of becoming immune, either by conventional vaccination or exposure to disease

Intact pigs – male pigs that have not been castrated but have not been kept for breeding purposes

Lactating – period when a sow provides milk to her pigs



Lagoon – a biological treatment system designed and operated for biodegradation, or converting organic matter to a more stable end product; lagoons may be anaerobic, aerobic or facultative



Litter – the group of pigs born to a sow during one farrowing; normally 8-12 pigs per litter

Loin – wholesale cut of pork that is comprised of the spine and associated muscles between the shoulder and the ham

Market-weight pigs – pigs that have reached 240 to 280 pounds

Mating – breeding an estrous gilt or sow

Meat breeds – breeds used in boar lines in cross-breeding schemes; include Hampshire, Duroc, Poland China, and Pietrain

Mother breeds – used in maternal lines in cross-breeding schemes; include Yorkshire, English Large White, Landrace, and Chester White

Necropsy – post-mortum examination of a pig; used as a veterinarian diagnostic tool

Non-productive sow days – days a sow is neither lactating or gestating

Niche pork production – supplying unique pork and pork products in a way that specific customer segments prefer or value; does not use traditional commodity market channels and does not necessarily mean “small”

Nursery pig – the growth phase from weaning until pigs enter the feeder phase

Nursing pig – any pig not yet weaned

Offal – entrails and internal organisms of an animal used for food

Pasture system – a pork production system in which pigs are housed in large paddocks containing grass or legume forages; housing is usually limited to primitive, portable, open front buildings that are manually ventilated and bedded with straw, corn stalks or other materials as needed



Parity – the condition of having given birth or, for sows, farrowed; second-parity sows have farrowed two litters, third-parity sows three litters, etc.

Pen mating – boar is placed in a pen with a group of sows to allow for breeding

Per capita consumption – total consumption of a good divided by total U.S. population; can be measured on three different weight bases

Carcass weight - the weight of pork in carcass form after evisceration, de-hairing and removal of the head and internal fat. The most appropriate measure of pork produced by packing plants.

Retail weight - the estimated weight of the retail cuts that comes from a carcass. USDA currently estimates that one pound of carcass weight pork yields 0.762 pounds of retail weight pork. This is the most appropriate estimate of pork purchased by consumers.

Boneless equivalent - the estimated weight of boneless pork that comes from a carcass. USDA currently estimates that one pound of retail weight pork yields 0.96 pounds of boneless pork. This is the most appropriate estimate of pork actually eaten by consumers.

Picnic – a wholesale cut of pork comprised of the lower portion of the shoulder and front leg

Pig – term usually applied to young, immature swine

Piglet – newborn pigs

Piglet – the number of pigs produced by a given number of sows; usually expressed as the percent of pigs weaned to sows bred

Production – the number of pounds of a specific meat produced; determined by the number of animals slaughtered/ harvested and the average weight of the animals; usually measured in carcass weight for pork and beef, and in ready-to-cook weight for poultry

Segregated Early Weaning (SEW) – removal of pigs from mother at 10 - 14 days of age in order to reduce disease transmission from the mother to her offspring

Service – breeding, or the deposition of boar semen into the female; may be done naturally by a boar or artificially by the manager using semen obtained from a local boar or purchased from a supplier

Sirloin – the distal (rearward) end of the loin.

Sludge – a layer of settled solids found in manure storage; primarily accumulated in lagoons

Slurry – manure with a consistency of 5-10 percent dry matter handled by some liquid storage systems

Sow – female pig that has farrowed at least one litter

Supply – the quantities of a good which producers are willing and able to sell at alternative prices.

Tenderloin – the muscle that lies on both sides of the spine against the ribs at the distal end of the loin

Tilth – the workability of soil

Wean – to separate young pigs from the sow

Weaner pig – pigs from weaning up to about 40 pounds

Yield – amount of salable retail cuts that can be obtained from a carcass



For More Information...

Pork Checkoff

Contact the National Pork Board, which oversees the Pork Checkoff, for more information about Checkoff-funded research, education and promotion programs.

National Pork Board

1776 NW 114th St.
Des Moines, IA 50325
(515) 223-2600

Pork Checkoff Service Center

(800) 456-7675

State Associations

The Pork Act requires that a percentage of the Checkoff funds collected each year be returned to the state pork producer associations. On average, about 20 percent of producer and importer Checkoff receipts are returned to states and used for state Checkoff-funded projects. Contact information for the 44 state pork associations as of Jan. 15, 2011 was as follows.

Alabama Pork Producers

Guy Hall
PO Box 11000
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Montgomery, AL 36191
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Arizona Pork Council

Tom Miller
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Casa Grande, AZ 85222-1004
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Arkansas Pork Producers Association

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California Pork Producers Association

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Colorado Pork Producers Council

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